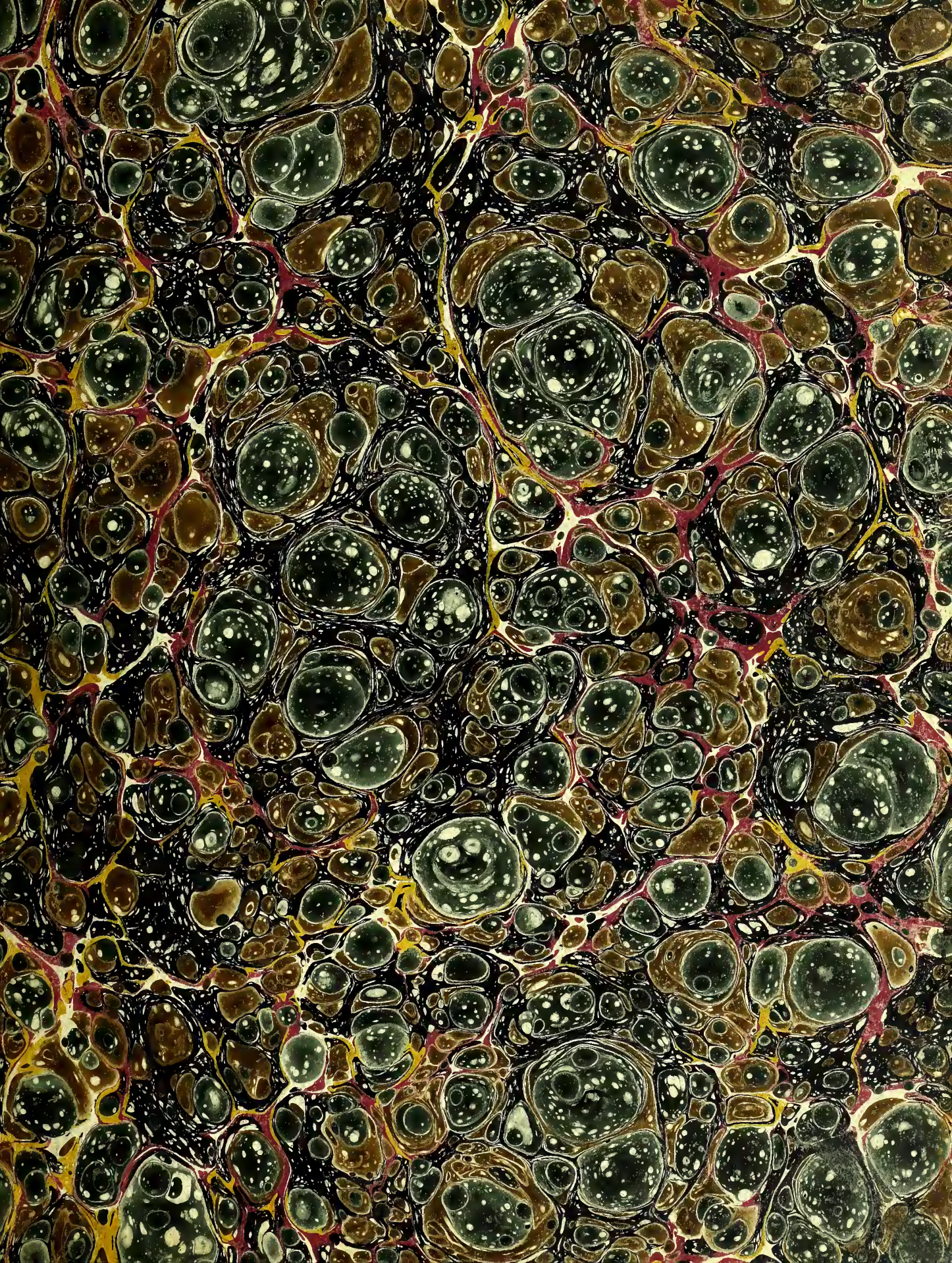
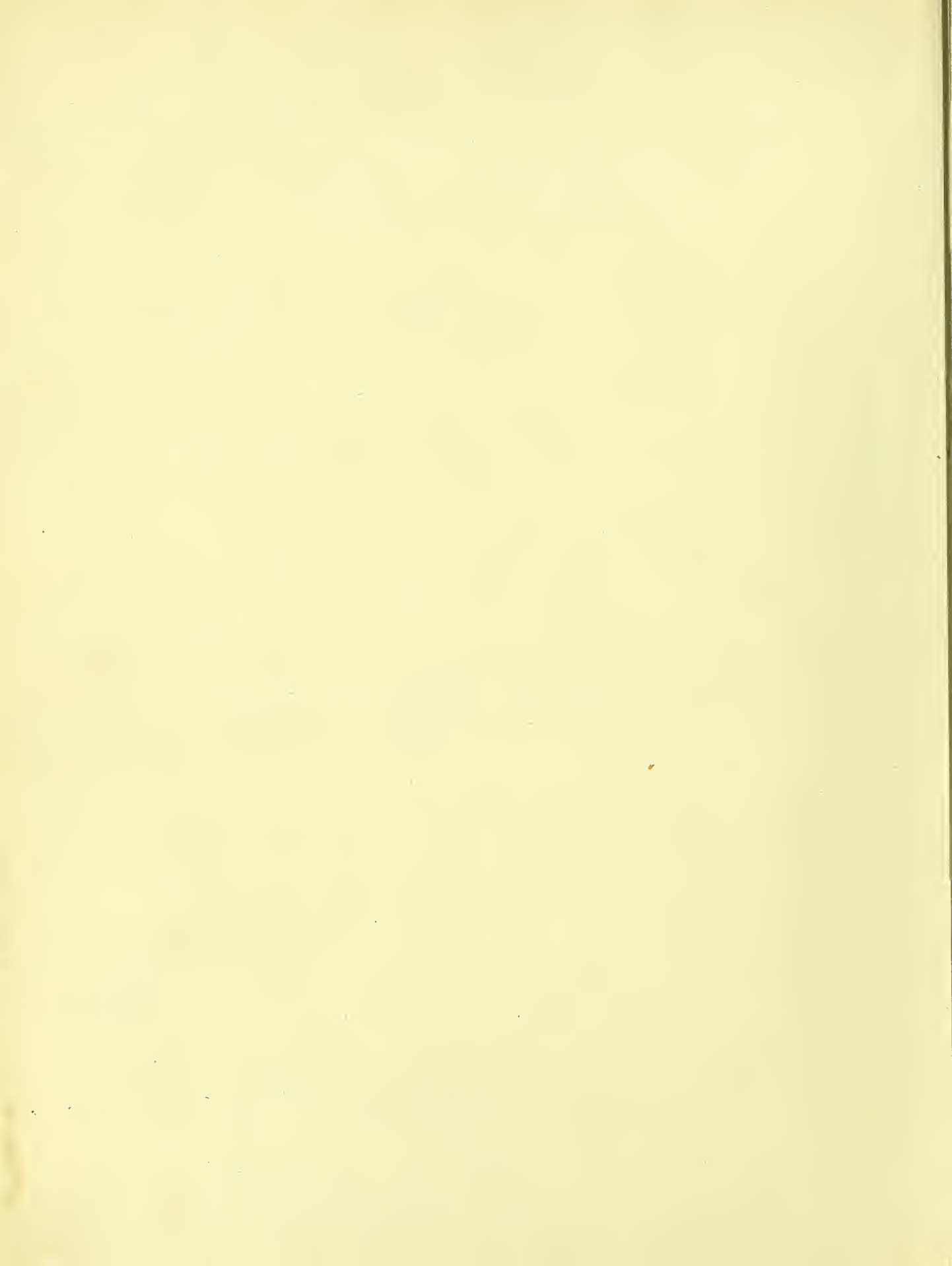


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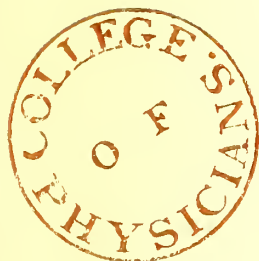
Arts, Sciences, and Literature.

BY

ABRAHAM REES, D.D. F.R.S. F.L.S. *S. Amer. Soc.*

WITH THE ASSISTANCE OF

EMINENT PROFESSIONAL GENTLEMEN.



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IN THIRTY-NINE VOLUMES.

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CYCLOPÆDIA:

OR, A NEW

UNIVERSAL DICTIONARY

OF

ARTS and SCIENCES.

NEWTONIAN PHILOSOPHY.

NEWTONIAN PHILOSOPHY, the doctrine of the universe, and, particularly, of the heavenly bodies; their laws, affections, &c. as delivered by sir Isaac Newton.

The term Newtonian philosophy is applied very differently; whence have sprung divers confused notions relating to it.

Some authors, under this philosophy, include the whole corpuscular philosophy considered as it now stands corrected and reformed by the discoveries and improvements made in several parts of it by sir Isaac Newton, in which sense it is that s^r Gravefande calls his *Elements of Physics*, “*Introductio ad Philosophiam Newtonianam*.” And in this sense the Newtonian is the same with the new philosophy, and stands contradistinguished to the Cartesian, the Peripatetic, and the ancient corpuscular.

Others, by Newtonian philosophy, mean the method or order which sir Isaac Newton observes in philosophizing, *viz.* the reasoning and drawing of conclusions directly from phenomena, exclusive of all previous hypotheses; the beginning from simple principles; deducing the first powers and laws of nature from a few select phenomena, and then applying those laws, &c. to account for other things. (See *Law of NATURE*.) And, in this sense, the Newtonian philosophy is the same with the experimental philosophy; and stands opposed to the ancient corpuscular.

Others, by Newtonian philosophy, mean that in which physical bodies are considered mathematically, and by which geometry and mechanics are applied to the solution of phenomena. In which sense, the Newtonian is the same with the mechanical and mathematical philosophy.

Others, again, by Newtonian philosophy, understand that part of physical knowledge which sir Isaac Newton has handled, improved, and demonstrated, in his *Principia*.

Others, lastly, by Newtonian philosophy, mean the new

principles which sir Isaac Newton has brought into philosophy; the new system founded on them; and the new solutions of phenomena thence deduced; or that which characterises and distinguishes his philosophy from all others; which is the sense in which we shall chiefly consider it.

As to the history of this philosophy, we have but little to say: it was first made public in the year 1686, by the author, then a fellow of Trinity college, Cambridge; and in the year 1713 republished, with considerable improvements. Several other authors have since attempted to make it plainer; by setting aside many of the more sublime mathematical researches, and substituting either more obvious reasoning, or experiments, in lieu of them; particularly Whiston, in his *Prælect. Phys. Mathemat.*; s^r Gravefande, in *Element. et Instit.*; and Dr. Pemberton, in his *View*; and Maclaurin, in his excellent work, intitled “*An Account of sir Isaac Newton’s Philosophical Discoveries*.”

Notwithstanding the great merit of this philosophy, and the universal reception it has met with at home, it gained ground at its first publication but slowly abroad; Newtonianism had scarcely two or three adherents in a nation; but Cartesianism, Huygenianism, and Leibnitzianism, maintained their ground, till the force of truth prevailed. And it is now held in the utmost veneration both at home and abroad.

The philosophy itself is laid down principally in the third book of the *Principia*. The two preceding books are taken up in preparing the way for it, and laying down such principles of mathematics as have the nearest relation to philosophy: such are the laws and conditions of powers. And these, to render them less dry and geometrical, the author illustrates by scholia in philosophy, relating chiefly to the density and resistance of bodies, the motion of light and sounds, a vacuum, &c.

B

In

In the third book he proceeds to the philosophy itself ; and from the same principles deduces the structure of the universe, and the powers of gravity, by which bodies tend towards the sun and planets ; and from these powers, the motions of planets, and comets, the theory of the moon ; and the tides.

This book, which he calls "De Mundi Systemate," he tells us was first written in the popular way ; but considering, that such as are unacquainted with the said principles would not conceive the force of the consequences, nor be induced to lay aside their ancient prejudices ; for this reason, and to prevent the thing from being in continual dispute, he afterwards digested the sum of that book into propositions, in the mathematical manner ; so as it might only come to be read by such as had first considered the principles ; not that it is necessary a man should master them all ; many of them, even the first rate mathematicians would find a difficulty in getting over. It is enough to have read the definitions, laws of motion, and the three first sections of the first book : after which the author himself directs us to pass on to the book "De Systemate Mundi."

The several articles of this philosophy are delivered under their respective heads ; as SUN, MOON, PLANET, COMET, EARTH, AIR, CENTRAL, CENTRIFUGAL, and CENTRIPETAL Force, RESISTANCE, MEDIUM, MATTER, SPACE, ELASTICITY, GRAVITY, &c. A general idea, or abstract of the whole, we shall here lay before the reader, to shew in what relation the several parts stand to each other.

The great principle on which the whole philosophy is founded, is the power of gravity. This principle is not new : Kepler, long ago, hinted it in his "Introduct. ad Mot. Martis." He even discovered some of the properties of it, and their effects in the primary planets ; but the glory of bringing it to a physical demonstration was reserved to the English philosopher. See GRAVITY.

His proof of the principle from phenomena, together with the application of the same principle to the various other appearances of nature, or the deducing those appearances from that principle, constitute the Newtonian system ; which, drawn in miniature, will stand thus :

I. The phenomena are, 1. That the satellites of Jupiter do, by radii drawn to the centre of the planet, describe areas proportionable to their time ; and that their periodical times are in a sesquiquiplicate ratio of their distances from its centre ; in which the observations of all astronomers agree. 2. The same phenomenon holds of the satellites of Saturn with regard to Saturn ; and of the moon with regard to the earth. (See MOON.) 3. The periodical times of the primary planets about the sun are in a sesquiquiplicate ratio of their mean distances from the sun. But, 4. The primary planets do not describe areas any way proportional to their periodical times about the earth ; as being sometimes seen stationary, and sometimes retrograde with regard to it.

II. 1. The powers by which the satellites of Jupiter are constantly drawn out of their rectilinear course, and retained in their orbits, do respect the centre of Jupiter, and are reciprocally as the squares of their distances from the same centre. 2. The same holds of the satellites of Saturn with regard to Saturn ; of the moon with regard to the earth, and of the primary planets with regard to the sun.

III. The moon gravitates towards the earth, and by the power of that gravity is retained in her orbit ; and the same holds of the other satellites with respect to their primary planets ; and of the primaries with respect to the sun. See GRAVITY and MOON.

As to the other secondary planets, their phenomena, with respect to their primary ones, being of the same kind with those of the moon about the earth, it is argued by analogy, that they depend on the same causes ; it being a rule or axiom in which all philosophers agree ; that effects of the same kind have the same causes. Again, attraction is always mutual, *i. e.* the re-action is equal to the action : consequently, the primary planets gravitate towards their secondary ones ; the earth towards the moon, and the sun towards them all. And this gravity, with regard to each separate planet, is reciprocally as the square of its distance from its centre of gravity.

IV. All bodies gravitate towards all the planets ; and their weights towards any one planet, at equal distances from the centre of the planet, are proportional to the quantity of matter in each.

For the law of the descent of heavy bodies towards the earth, setting aside their unequal retardation from the resistance of the air, is this, that all bodies fall equally in equal times ; but the nature of gravity or weight, no doubt, is the same on the other planets as on the earth. Suppose, *e. gr.* such bodies raised to the surface of the moon, and together with the moon, deprived at once of all progressive motion, and dropped towards the earth ; it is shewn, that in equal times they would describe equal spaces with the moon ; and, therefore, that their quantity of matter is to that of the moon, as their weights to its weight. Add, that since Jupiter's satellites revolve in times that are in a sesquiquiplicate ratio of their distances from the centre of Jupiter, and consequently at equal distances from Jupiter, their accelerating gravities are equal ; therefore, falling equal altitudes in equal times, they will describe equal spaces, just as heavy bodies do on our earth. And the same argument will hold of the primary planets with regard to the sun. And the powers by which unequal bodies are equally accelerated are as the bodies, *i. e.* the weights are as the quantities of matter in the planets. And the weights of the primary and secondary planets towards the sun are as the quantities of matter in the planets and satellites. And hence are several corollaries drawn relating to the weights of bodies on the surface of the earth, magnetism, and the existence of a vacuum ; which see under VACUUM, WEIGHT, and MAGNETISM.

V. Gravity extends itself towards all bodies, and is in proportion to the quantity of matter in each.

That all the planets gravitate towards each other has been already shewn ; likewise, that the gravity towards any one, considered apart, is reciprocally as the square of its distance from the centre of the planet ; consequently, gravity is proportional to the matter in them. Farther, as all the parts of any planet, A, gravitate towards another planet, B ; and the gravity of any part is to the gravity of the whole, as the matter of the part to the matter of the whole ; and re-action equal to action ; the planet B will gravitate towards all the parts of the planet A ; and its gravity towards any part will be to its gravity towards the whole, as the matter of the part to the matter of the whole.

Hence we derive methods of finding and comparing the gravities of bodies towards different planets ; of finding the quantities of matter in the several planets, and their densities ; since the weights of equal bodies revolving about planets are as the diameters of their orbits, directly ; and as the squares of the periodical times, inversely ; and the weights at any distance from the centre of the planet are greater or less in a duplicate ratio of their distances, inversely ; and since the quantities of matter in the planets are as their powers at equal distances from their centres ; and, lastly, since the weights

weights of equal and homogeneous bodies towards homogeneous spheres are, at the surface of the spheres, as the diameters of these spheres; and consequently, the densities of heterogeneous bodies are as the weights at the distances of the diameters of the spheres.

VI. The common centre of gravity of the sun, and all the planets, is at rest; and the sun, though always in motion, yet never recedes far from the common centre of all the planets.

For the matter in the sun being to that in Jupiter as 1033 to 1; and Jupiter's distance from the sun to the semidiameter of the sun in a ratio somewhat bigger; the common centre of gravity of Jupiter and the sun will be found a point a little without the sun's surface. And, by the same means, the common centre of Saturn and the sun will be found a point a little within the sun's surface; and the common centre of the sun, and all the planets, will be scarcely one diameter of the sun distant from its centre. But the centre is always at rest; therefore, though the sun will have a motion this and that way, according to the various situations of the planets, yet it can never recede far from the centre. So that the common centre of gravity of the earth, sun, and planets, may be esteemed the centre of the whole world.

VII. The planets move in ellipses that have their foci in the centre of the sun, and describe areas proportional to their times.

This we have already laid down *à posteriori*, as a phenomenon; and now, that the principle of the heavenly motions is shewn, we deduce it from them *à priori*. Thus, since the weights of the planets towards the sun are reciprocally as the squares of the distances from the centre of the sun; if the sun were at rest, and the other planets did not act on each other, their orbits would be elliptical, having the sun in their common umbilicus, and they would describe areas proportional to the times; but the mutual actions of the planets are very small, and may be well thrown aside. Therefore, &c.

Indeed, the action of Jupiter on Saturn is of some consequence; and hence, according to the different situations and distances of those two planets, their orbits will be a little disturbed.

The sun's orbit too is sensibly disturbed by the action of the moon; and the common centre of the two describes an ellipsis round the sun placed in the umbilicus; and with a radius drawn to the centre of the sun, describes areas proportional to the times.

VIII. The aphelia and nodes of the planets are at rest; excepting for some inconsiderable irregularities arising from the actions of the revolving planets and comets. Consequently, as the fixed stars retain their position to the aphelia and nodes, they too are at rest.

IX. The axis, or polar diameter, of the planets is less than the equatorial diameter.

The planets, if they had no diurnal rotation, would be spheres, as having an equal gravity on every side; but, by this rotation, the parts receding from the axis endeavour to rise towards the equator, which, if the matter of which they consist be fluid, will be affected very sensibly. Accordingly Jupiter, whose density is found not much to exceed that of water on our globe, is observed by the astronomers to be considerably less between the poles, than from east to west. And on the same principle, unless our earth were higher at the equator than towards the poles, the sea would rise under the equator, and overflow all near it.

But this figure of the earth Sir Isaac Newton proves likewise *à posteriori*; from the oscillations of pendulums being

flower and smaller in the equatorial than the polar parts of the globe.

X. All the moon's motions, and all the inequalities in those motions, follow from these principles: *e. gr.* her unequal velocity, and that of her nodes, and apogee in the syzygies and quadratures; the differences in her eccentricity, and her variation, &c. See MOON, QUADRATURE, SYZYGY, &c.

XI. From the inequalities in the lunar motions, we can deduce the several inequalities in the motions of the satellites.

XII. From these principles, particularly the action of the sun and moon upon the earth, it follows, that we must have tides; or that the sea must swell and subside twice every day. See TIDE.

XIII. Hence likewise follow the whole theory of comets; as, that they are above the region of the moon, and in the planetary spaces; that they shine by the sun's light reflected upon them; that they move in conic sections, whose umbilici are in the centre of the sun; and by radii drawn to the sun, describe areas proportional to the times; that their orbits, or trajectories, are very nearly parabolas; that their bodies are solid, compact, &c. like those of the planets, and must therefore acquire an immense heat in their perihelia; that their tails are exhalations arising from them, and encompassing them like atmospheres. See COMET.

The objections raised against this philosophy are chiefly aimed at the principle, gravity; which some condemn as an *occult quality*; and others as a *miraculous* and preternatural cause; neither of which have any longer room in sound philosophy. Others, again, set it aside, as destroying the notion of vortices; and others, as supposing a vacuum. But these are all abundantly obviated under GRAVITY, ATTRACTION, VORTEX, VACUUM, and QUALITY.

NEWTOWN, in *Geography*, a small borough-town in the parish of Calbourne, and north-west half hundred of West-Medina liberty, in the Isle of Wight, and county of Southampton, England, is situated on a small river, to which it gives name, on the north-west extremity of the island. It was anciently called Francheville, and occurs under that appellation in its original charter, granted by Aymer, bishop of Winchester, and subsequently confirmed by Edward II., Edward IV., and queen Elizabeth. At present it is only a very trifling place, but the numerous traces of streets, still distinctly visible, sufficiently indicate its former extent and importance. Many small burghage lands lie on each side of the old streets; and in some old writings, the names both of High-street and Gold-street are frequently mentioned. But though much decayed, Newtown continues to be governed by a mayor and twelve burgesses, as a corporate borough, by prescription. Two members are sent from hence to serve in parliament; a privilege which this town first enjoyed in the 27th year of queen Elizabeth. These are elected in the town-hall; the elective franchise being vested in the mayor and burgesses holding borough lands, as determined by a committee of the house of commons in 1729. The haven of Newtown affords the best security for shipping of any about the island; and, at high water, is capable of floating vessels above 500 tons burden. "The water and fishery is claimed by the mayor and burgesses. They hold a court-leet, and appoint constables; but pay a rent to the lord of the manor of Swainston." *Worsley's History of the Isle of Wight. Beauties of England and Wales*, by E. W. Brayley, and J. Britton, F.S.A., vol. vi.

NEWTOWN, a market-town in the hundred of Newtown, and county of Montgomery, North Wales, is situated on

the south bank of the river Severn, at the distance of nine miles south-west from Montgomery, and 176 north-west from London. It is a pleasant place; but most of the buildings being partly erected with timber, gives it rather an appearance of meannefs. The market here is held on Tuesday every week, and there are five well-attended fairs annually. The ancient name of this place was Llan-Fair-Ynhedewain, or St. Mary, in the cantref of Cydwain; the increase of houses and population having given origin to its present appellation. The woollen trade is carried on here, and in the vicinity, to a considerable extent, and many persons are still employed in the various processes; though it must be confessed that the number of these has been much reduced of late, by the introduction of machinery. Flannel is the chief article of produce, and is supplied in every degree of fineness. In the church, which is an ancient edifice, not remarkable for its architecture, is an altar-piece painted by Dyer the poet, and an antique font and screen, both of which are said to have been brought from the abbey of Cwmhir, in Radnorshire. The petty-sessions for the upper division of the hundred are held in this town, which appears to have more than doubled its population since 1801. According to the parliamentary returns of that year, the whole parish contained only 203 houses, and 990 inhabitants; but by the late returns (1811), the former are estimated at 438, and the latter at 2025 in number. Such are the effects of an increasing trade, which has no doubt been considerably promoted by the canal navigation opened between this town and the Grand Trunk, by means of the Montgomeryshire canal.

Adjoining to the town stands Newtown-Hall, a seat of the Prices, of the royal tribe of Elystan Glodrydd. The late owner, sir John Price, was extremely eccentric. He married three wives, and kept the first two after their demise in an embalmed state, placing them in his chamber, one on each side of his bed. The third wife, however, with a becoming spirit, refused the knight the honour of her hand, till he had removed the defunct rivals, and committed them to a proper place of interment. Caerſws, a small village about five miles west from Newtown, is supposed to have been a Roman station, though not enumerated in any of the Itineraries, as the fields around bear evident traces of ancient streets; and some hewn stones and bricks, such as the Romans used in the construction of their cities, are frequently discovered. On the north and west sides there yet remain deep hollows, which, from their arrangement, are conjectured to be portions of the fossa or ditch, once surrounding the precinct of the station. Two encampments are placed in the immediate vicinity; and at the distance of a mile is a third, of very large dimensions, and peculiar construction; all of them undoubtedly Roman. On the south side of the last is an immense mount of a conical shape, surrounded by a very wide and deep fosse. The use of this appendage cannot well be ascertained, unless it may be considered as having been the site of an exploratory tower. At the northern end of the fosse is an oblong area, varying considerably in breadth, and defended on all sides by a lofty vallum, which constitutes the scarp side of a deep ditch. This leads, at one extremity, by a porta, or entrance way, into a rectangular camp; and at the other is connected, in a similar manner, with the conical mount. The whole is encircled by a large outer rampart and fosse, so that it must have been a position of very great strength; a circumstance inferring a more than ordinary degree of importance.

North-east from Newtown, to the west of the road leading to Montgomery, stand the ruins of Dulforwyn castle. This fortress occupied the summit of a mountainous ridge, ex-

ceedingly precipitous, and nearly surrounded by a woody dingle. It was built, according to Dugdale, by David ap Llewellyn, a prince who reigned from the year 1240 to 1246; but the works of John Dafydd Rhys assign to it a much earlier date, stating it to have been erected by Bled-dyn ap Cynfyn, some time between the years 1065 and 1073. In 1278 it was granted, by Edward I., to Roger de Mortimer, along with the castles of Kedewen and Keri, to be held *in capite*, by the service of three knights' fees. The origin of the name of this place, which signifies "the meadows of the maiden," has been a subject of much curious inquiry among antiquaries. Pennant considers it having an allusion to the legendary story of Sabrina, related by Jeffrey of Monmouth, and so finely described by Milton in his *Mask of Comus*. Rowland's *Mona Antiqua*, 4to. *Beauties of England and Wales*, vol. xvii. by the Rev. J. Evans.

NEWTOWN of Ayr. See *AYR Newtown*.

NEWTOWN, a post-town of America, in Fairfield county, Connecticut, pleasantly situated on an elevated spot, and settled in 1708; 80 miles N.E. of New York.—Also, a town on Staten island, New York; 9 miles S.W. of New York.—Also, a township in Queen's county, New York, including all the islands in the Sound opposite to the same, and containing 2312 inhabitants, of whom 512 are slaves; about 8 miles E. of New York.—Also, a township in West Chester county, New York, of whose inhabitants 276 are electors.—Also, a post-town in Tioga county, New York, situated between the south end of Seneca lake and Tioga river, taken from Chemung coast on the east, and incorporated in 1792; containing 1333 inhabitants.—Also, a township in Gloucester county, New Jersey.—Also, a post-town and seat of justice in Sussex county, New Jersey, about 10 miles S.E. of Sandyton. It contains a large Presbyterian church, a stone court-house, and gaol. The manufacture of iron is carried on in a furnace and four forges. Here is a remarkable cave called the Devil's hole, and in its vicinity are several ponds, covering from 5 to 100 acres; 108 miles N.E. of Philadelphia.—Also, a post-town and capital of Bucks county, Pennsylvania; containing a Presbyterian church, a stone gaol, a court-house, an academy, and about 40 houses; settled in 1725; 10 miles W. of Trenton.—Two other townships of this name are situated, the one in Delaware county, the other in that of Cumberland, having 1427 inhabitants.—Also, a small town of Virginia, situated in Frederick county, between the north and south branches of Shenandoah river; 7 miles S. of Winchester.

NEWTOWN Ardes, a post-town of the county of Down, Ireland, pleasantly situated on the northern extremity of Strangford lough. It was incorporated by James I., and, before the union, sent two members to the house of commons. It is 88 miles N. by E. from Dublin, and 8 E. from Belfast.

NEWTOWN Barry, a small town or village of the county of Wexford, Ireland. It is situated on the river Slaney, on the confines of the county of Carlow, and is said to be one of the prettiest villages in Ireland. Its fairs are much frequented. It is 48 miles S. by W. from Dublin, and 12 N. by W. from Enniscorthy.

NEWTOWN Breda, a village of the county of Down, Ireland, remarkable for the beauty of its church, which attracts the attention of all travellers. It is 3½ miles S.S.E. from Belfast, and 20 N.W. from Downpatrick.

NEWTOWN Glens, a post-town of the county of Antrim, Ireland, situated on Cashendal or Red bay, in the North Channel.

Channel. It is 109 miles N. by E. from Dublin, and 29 miles N. by E. from Belfast.

NEWTOWN *Hamilton*, a post-town of the county of Armagh, Ireland, in the district of the Fews Mountains; 53 miles N. by W. from Dublin, and $12\frac{1}{2}$ miles N. by W. from Dundalk.

NEWTOWN *Limavaddy*, a post and market-town of the county of Londonderry, Ireland, which, before the union, was represented in parliament. It is situated upon the river Roe, and has a good linen market. It is 106 miles N. by W. from Dublin, and 10 miles W. from Coleraine.

NEWTOWN *Mount Kennedy*, a post-town of the county of Wicklow, Ireland, adjoining which is the fine seat of lord Rossmore. It is 17 miles S. by E. from Dublin.

NEWTOWN *Stewart*, a post-town of the county of Tyrone, Ireland, situated on the river Moyle. Near this is Baron's Court, a fine seat of the marquis of Abercorn. It is 93 miles N.N.W. from Dublin, and 8 miles S.E. from Strabane.

NEWTYA, a town of Hindoostan, in Concan; 40 miles N.N.W. of Goa.—Also, a town of Hindoostan, in Bengal; 30 miles E. of Rangpour.

NEW VINEYARD, a town in Kennebeck county, Maine, west of Kennebeck river, between Anson and Strong; 40 miles N.W. of Augusta.

NEW UTRECHT, a small maritime town of New York, in King's county, Long island, opposite to the Narrows; 7 miles S. of New York city, and containing 778 inhabitants.

NEW WERKT, a small island in the German sea, at the mouth of the Elbe, near the coast of Bremen; 7 miles W. of Cuxhaven.

NEW WINDSOR, a township of Orange county, New York, pleasantly situated on the west branch of Hudson river; 3 miles S. of Newburgh, and containing 2001 inhabitants. The township is famous for a scythe manufacture. Its compact part contains about 40 houses, and a Presbyterian church; 64 miles N. of New York.

NEW WORK ISLAND, a small island near the north-east coast of Newfoundland. N. lat. $49^{\circ} 55'$. W. long. $54^{\circ} 30'$.

NEW YEAR'S HARBOUR, a good harbour on the north coast of Staten Land island, discovered Jan. 1, 1775, whence its name, and affording wood and good water. S. lat. $54^{\circ} 50'$. W. long. $64^{\circ} 25'$.

NEW YEAR'S *Islands*, a group of small islands in the South Pacific ocean, on the north coast of Staten Land. Captain Cook landed on the most easterly on the 31st of December 1774, and killed a great number of seals and birds. These islands, says captain Cook, are in general so unlike Staten Land, especially that on which we landed, that it deserves a particular description. It shews a surface of equal height, and elevated about 30 or 40 feet above the sea, from which it is defended by a rocky coast. The inner part of the isle is covered with a sort of sward-grass, very green, and of a great length. It grows on little hillocks of two or three feet in diameter, and as many or more in height, in large tufts, which seemed to be composed of the roots of the plant matted together. Among these hillocks are a vast number of paths, made by sea-bears and penguins, by which they retire into the centre of the isle. It is nevertheless exceedingly bad travelling; for these paths are so dirty, that one is sometimes up to one's knees in mire. Besides this plant, there are some few other grasses, a kind of heath, and some celery. The whole surface is moist and wet, and on the coast are several small streams of water. The animals found on this little spot are sea-lions, sea-bears, a variety of

oceanic and some land-birds. The sea-lions are not of that kind described under the same name by lord Anson; but for aught I know, these would more properly deserve that appellation; the long hair with which the back of the head, the neck, and shoulders are covered, giving them greatly the air and appearance of a lion. The other part of the body is covered with short hair, little longer than that of a cow or a horse; and the whole is of a dark brown. The female is not half so big as the male, and is covered with a short hair of an ash or light dun colour. They live, as it were, in herds, on the rocks, and near the sea-shore. As this was the time for engendering, as well as bringing forth their young, we have seen a male with 20 or 30 females about him, and always very attentive to keep them all to himself, and beating off every other male who attempted to come into his flock. The sea-bears are not so large by far as the lions, but are rather larger than the common seal. They have none of that long hair which distinguishes the lion: theirs is all of an equal length, and finer than that of the lion, somewhat like an otter's; and the general colour is that of an iron-grey. This is the kind which the French call sea-wolves, and the English seals: they are, however, different from the seals in Europe and North America. The lions may too, without any great impropriety, be called overgrown seals; for they are all of the same species. S. lat. $54^{\circ} 41'$. W. long. $64^{\circ} 28'$. Cook's Second Voyage, vol. ii. chap. 4.

NEW YORK *State, County, City, &c.* See *New York*.

NEXAPA, or *St. Yago de Nexapa*, a town of Mexico, in the province of Guaxaca; 50 miles E. S. E. of Guaxaca. N. lat. $17^{\circ} 19'$. W. long. $97^{\circ} 46'$.—Also, a town of Mexico, in the province of Guatemala; 10 miles S.E. of St. Salvador. N. lat. $13^{\circ} 56'$. W. long. 90° .

NEXELOE, a small island of Denmark, near the W. coast of Laaland. N. lat. $35^{\circ} 47'$. E. long. $11^{\circ} 19'$.

NEXI, among the Romans, persons free-born, who, for debt, were delivered bound to their creditor, and obliged to serve him, till they could pay the debt.

NEXOIE, in *Geography*, a sea-port town of Denmark, on the E. coast of the island of Bornholm, with a harbour for small ships.

NEXON, a town of France, in the department of the Upper Vienne, and chief place of a canton, in the district of St. Yrioux; 15 miles S.S.W. of Limoges. The place contains 1781, and the canton 8426 inhabitants, on a territory of $207\frac{1}{2}$ kilometres, in nine communes.

NEXPA, a town of Mexico, in the province of Guafteca; 60 miles S.S.W. of Panuco.

NEXT TAKER, among *Miners*, is he that hath the next meer in possession.

NEXUS of *Matter*. See COHESION.

NEYBA, in *Geography*, a town of Portugal, in the province of Entre Duero e Minho, which runs into the sea, five miles S. of Viena.

NEYBA, or *Neiva*, a fertile plain on the S. side of the island of St. Domingo, bounded E. by the bay and river of its name, on the W. by the river of Dames and the pond of Henriquelle; containing about 80 square leagues, and abounding with game, flamingoes, pheasants, and royal or crowned peacocks. Nine leagues from the west bank of the river is the town, containing about 200 houses, and able to furnish 200 men capable of bearing arms. The territory produces a sort of plaster, talc, and fossil salt. The river might be rendered navigable for small craft, and the place might afford eligible situations for 150 sugar plantations.

NEYBA, or *Neyva*, a town of South America, and capital

capital of a district in New Granada, on the Madalena; 120 miles N.E. of Popayan. N. lat. $3^{\circ} 10'$. W. long. $74^{\circ} 16'$.

NEYDORF, a town of Austria; seven miles W.N.W. of Falkenstein.

NEYER, a district or circar of Hindoostan, between the sandy deserts of Cutch and the river Puddar, about 70 miles long and 20 broad.

NEYERN, a town of Bohemia, in the circle of Pilsen; 35 miles S.S.W. of Pilsen. N. lat. $49^{\circ} 16'$. E. long. $13^{\circ} 2'$.

NEYKIRCHEN, a town of Austria; six miles S.W. of Neustatt.

NEYLEAU, a town of Germany, in the principality of Culmbach; eight miles W. of Hof.

NEYMARCK, a town of Austria; six miles S. of Ips.

NEYMARKT, a town of Austria; six miles W. of Efferding.

NEYSTADT, a town of Austria; eight miles W. of Ips.

NEZ de *Ibbourg*, a cape on the W. coast of France, in the English channel, about a league S. of cape Anderville. N. lat. $49^{\circ} 40'$.

NEZ de *Querqueville*, a cape on the W. coast of France, in the English channel; three miles N.W. of Cherbourg.

NEZENHEIM, a town of Germany, in the county of Limburg; five miles S.E. of Markt Einersheim.

NEZIN, a town of Russia, in the government of Tchernigov, considerable for its fur trade; 28 miles S.E. of Tchernigov. N. lat. $50^{\circ} 3'$. E. long. $31^{\circ} 52'$.

NEZITZA, a river of Russia, in the government of Archangel, which runs into the Frozen ocean; 28 miles S. of Ponoï.

NEZLET el *Gindi*, a town of Egypt, on the right bank of the Nile; seven miles N. of Atfeh.

NGAN-CHAN, a city of China, of the first rank, in the province of Koei-tcheou; situated in a mountainous territory, and containing several subordinate cities with garrisoned forts for keeping in awe the independent inhabitants of the mountains. The vallies and plains are well watered, and need only indultry to render them productive. N. lat. $26^{\circ} 12'$. E. long. $15^{\circ} 32'$.

NGAN-KING, a city of China, of the first rank, in the province of Kiang-nan, and capital of the western part of the province; delightfully situated, and governed by a particular viceroy, who keeps a large garrison in a fort built on the banks of the river Yang-tse-kiang. The commerce and riches of this country render it very considerable, and every thing that is conveyed from the southern part of China to Nan-king must pass through it. The whole country belonging to it is level, pleasant, and fertile. Under its jurisdiction are six cities of the third class. N. lat. $30^{\circ} 37'$. E. long. $116^{\circ} 14'$.

NGAN-LO, a city of China, of the first rank, in the province of Hou-quang, which is commercial and rich. In its district are two towns of the second order, and five of the third. N. lat. $31^{\circ} 14'$. E. long. $111^{\circ} 24'$.

NGAN-PIN-TCHING, a small island in the Chinese sea, near the W. coast of Formosa. N. lat. 23° . E. long. $119^{\circ} 34'$.

NGUIANQUE, a town of Africa, in the kingdom of Hoval; and sometimes called the capital.

NHAMDIA, in *Ichthyology*, the name of a fish caught in rivers of many parts of America, and of a fine taste. It is of the anguilliform kind, and has a long and fat body, becoming smaller toward the tail; its belly is soft; its head fat; and its mouth of a parabolic figure, and armed with

small teeth; it is usually of about eight or ten inches long; its tail is forked, and its head is covered with a strong shelly coat; this is of a dusky brown; its back and sides are of a blueish-grey; the larger back-fin is of the same colour; all the rest are black; and on each side there is a red line reaching lengthways from the gills to the tail.

NHANDIROBA, in *Botany*, an American name, which Piumier adopted from Marcgrave, for the very distinct genus called by Linnæus FEUILLEA; see that article.

NHANDUAPOA, in *Ornithology*, the name of a Brazilian bird, called also *jibirugacu*, but more frequently known by its Dutch name *scurvogel*. See MYCTERIA *Americana*.

NHANDUGUACU, the name of a Brazilian bird of the emeu, or cassowary kind, a species of the *struthio*, or ostrich, in the Linnæan system, but smaller than the common or African cassowary. Its body is considerably large; its neck long and strong; its legs very long and thick; its wings extremely short, and unfit for flying, but assisting it in running; its feathers are grey, and, on the back, are considerably long; it commonly carries its neck bent like a swan; its head is shaped like that of a goose; its back-feathers cover the rump, and make a sort of tail; it runs as swift as a greyhound, and feeds on flesh and fruits. See STRUTHIO *Rhea*.

NHAQUUNDA, in *Ichthyology*, the name of a small fish caught in the American rivers. Its body is oblong, and every where nearly of the same thickness; its head and mouth are like those of the pike; and its usual length is about four inches; it can extend its upper lip, and round the opening of its mouth; it has no regular teeth, but its jaws are rough like a file; its tail is covered with a hard shelly crust; its body is covered with moderately large scales, and its back and sides are of a silvery grey; its belly white; it has on each side a single row of round black spots. of the bigness of a pea, and among these a number of small blue ones.

NHING-KOUE, in *Geography*, a city of China, of the first rank, in the province of Kiang-nan; situated on a river which runs into the Yang-tse-kiang, surrounded by woody mountains, and distinguished by its manufactories of paper, made of a species of reed; it has under its jurisdiction six cities of the third class. N. lat. $31^{\circ} 2'$. E. long. $118^{\circ} 24'$.

NIAB, a town of Arabia, near the coast of the Red sea; 72 miles W.S.W. of Saade.

NIABANI, a river of West Florida, which runs into lake Maurepas. N. lat. $30^{\circ} 17'$. E. long. $90^{\circ} 26'$.

NIABUSSAN, a town of Bengal; 42 miles S.W. of Burdwan. N. lat. $22^{\circ} 45'$. E. long. $87^{\circ} 25'$.

NIAGARA, a town and fort of America, in the state of New York, on the southern shore of lake Ontario. The fort is situated on the eastern side of the river, and is now in the possession of the United States, and on the opposite, or British side, is the town, most generally known by the name of Niagara, although it has been named "Newark" by the legislature. The original name of the town was Nijara; it was afterwards called Lenox, then Nassau, and afterwards Newark. This town has been, and still is, the capital of the province of Upper Canada, but it has been proposed to remove the seat of government from this town to Toronto, which was deemed a more eligible spot for the meeting of the legislative bodies, as being further removed from the frontiers of the United States. The projected change, however, was not relished by the people at large, as Niagara is a much more convenient place of resort to most of them than Toronto. This change, however, was merely preparatory to another, which was the settlement of the seat of government in a new city, under the name of London, which

was to have been built on the river formerly called La Trenché, but now denominated the Thames, that runs into lake St. Clair. The fort was built by the French in the year 1725, but was taken by the English, under sir William Johnson, in 1759, and surrendered to the United States, according to the treaty of 1796, by the British. The town of Niagara stands on the summit of the western bank of the river, about 50 miles from the water's edge, and contains about 70 houses, a court-house, gaol, and a building intended for the accommodation of the legislative bodies. The houses, with few exceptions, are built of wood; those next the lake are rather poor, but at the upper end of the town are several excellent buildings, inhabited by the principal officers of government. Few places in North America have risen more rapidly than Niagara, and after acquiring the addition of almost all its houses in five years, it is still enlarging in size, on account partly of the increase of the back country trade along the shores of the lakes, and partly of the surprising emigrations of people from the states. The quantity of furs collected at Niagara is considerable, and the neighbourhood being populous, it is of course a place of no small trade; but the town in which this trade is carried on, being on the British side of the line, the few merchants that lived within the limits of the fort immediately crossed over to the other side, as soon as it was rumoured that the fort was to be given up. On the margin of Niagara river, about three-quarters of a mile from the town, stands a building called Navy-hall, erected for the accommodation of the naval officers on the lake during the winter season, when their vessels are laid up. Opposite to it there is a spacious wharf to protect the vessels from the sea during the winter, and also to facilitate the landing of merchandize when the navigation is open. All cargoes brought up the lake, that are destined for Niagara, are landed here. Adjoining the wharf are extensive stores belonging to the crown, and also to private persons.

The fort of Niagara stands immediately at the mouth of the river, on a point of land, one side of which is washed by the river, and the other by the lake. Towards the water it is stockaded; and behind the stockade, on the river side, a large mound of earth rises up, at the top of which are embrasures for guns; on the land side it is secured by several batteries and redoubts, and by parallel lines of fascines. At the gates, and in different parts, there are strong blockhouses; and facing the lake, within the stockade, stands a large fortified stone house. The fort and outworks occupy about five acres of ground; and a garrison of 500 men; and at least from 30 to 40 pieces of ordnance, would be necessary to defend it properly. The federal garrison, however, consists only of 50 men. From its situation the town commands a fine view of the lake and distant shores; and as it is so much elevated above the level of the water, one might imagine that it must be a remarkably healthy place, but it is, in fact, lamentably the reverse, the inhabitants being very subject to the ague. Indeed, not only the town of Niagara and its vicinity are unhealthy places, but almost every part of Upper Canada, and of the territory of the states bordering upon the lake, is likewise unhealthy. The sickly season commences about the middle of July, and terminates about the first week in September, as soon as the nights become cold. The most common disorders are intermittent fevers. Weld's Travels, vol. ii. N. lat. $43^{\circ} 14'$. W. long. $79^{\circ} 1'$.

NIAGARA River, a river of Canada, which issues from the eastern extremity of lake Erie, and after a course of 36 miles discharges itself into lake Ontario. This river forms part of the boundary between the United States and Upper

Canada. For the first few miles from lake Erie, the breadth of the river is about 300 yards, and it is deep enough for vessels drawing nine or ten feet water; but the current is so extremely rapid and irregular, and the channel so intricate, on account of the numberless large rocks in different places, that no other vessels beside bateaux ever attempt to pass along it. As you proceed downward, the river widens; no rocks are to be seen either along the shores, or in the channel, and the waters glide smoothly along, though the current continues very strong. The river runs thus evenly, and is navigable with safety for bateaux as far as fort Chippeway, about three miles above the falls. For an account of these falls, we refer to the article CATARACT.

NIAGAW, a town of Bengal; 12 miles S.S.W. of Noony.

NIAGEE, a town of Hindoostan, in Bahar; 48 miles S.S.W. of Patna.

NIAGUR, a town of Hindoostan, in the circle of the Ruttunpour; 27 miles N.W. of Ruttunpour.—Also, a town of Bengal; 28 miles N.W. of Rogonatpour. N. lat. $23^{\circ} 45'$. E. long. $86^{\circ} 25'$.

NIAK, a town of New York, on the right bank of the Hudson; 23 miles N. of New York.—Also, an island on the S.W. coast of East Greenland. N. lat. $59^{\circ} 45'$. W. long. $43^{\circ} 30'$.

NIAKDELSKOI, a town of Russia, in the government of Archangel; 62 miles N.N.W. of Kola.

NIALEL, in *Botany*, Rheede Hort. Malab. v. 4. 37. t. 16, a fine lofty evergreen tree, whose fruit, not unlike a bunch of grapes, is said by Rheede to be esteemed a delicacy. Linnæus has not referred it to any known plant. Jussieu guesses it to be really a species of *Vitis*.

NIALMA, in *Geography*, a town of Thibet; 76 miles N. of Catmandu. N. lat. $29^{\circ} 23'$. E. long. $85^{\circ} 27'$.

NIANA, a town of Hindoostan, in Dowlatabad; eight miles W. of Beder.

NIAPAGUR, a town of Bengal; 25 miles N. of Boglipoor.

NIAPON, a town of Africa, in Whidah; 10 miles E. of Sabi.

NIARAN KENTCHIAN, a mountain of Thibet. N. lat. $28^{\circ} 25'$. E. long. $83^{\circ} 44'$.

NIAS, a small island, near the W. coast of the island of Sumatra, celebrated for the beauty of its females, who are purchased as slaves by the Dutch and Portuguese residing in Batavia, and other places. N. lat. 1° . E. long. 97° .

NIASABAD, or NICZABAD, a town of Persia, in the province of Schirvan, with a harbour on the Caspian sea; 40 miles S. of Derbend. N. lat. $41^{\circ} 18'$.

NIB, in *Agriculture*, a term applied to the handle of a scythe.

NIBBIONE, in *Geography*, a town of Italy, in the department of the Lario; eight miles S.E. of Como.

NIBE, a town of Denmark, in North Jutland; nine miles W.S.W. of Aalborg.

NIBELES, an Abyssinian instrument, a kind of common flute, joined to a bag which receives the wind. This instrument seems to resemble the French musette. Bruce.

NIBIANO, in *Geography*, a town of the duchy of Piacenza; 16 miles S.W. of Piacenza.

NIBU, a town of Japan, in the island of Nippon; 165 miles N.W. of Jedo.

NICÆA, in *Ancient Geography*, a town of Bithynia, upon the lake Ascanius, according to Strabo, who gave it the title of "primaria Bithiniæ urbs." In his time it was of a square figure, and about 16 stadia in circumference. It was encompassed with a very fertile plain. It was called Antigoniz,

Antigonia, by Antigonus, son of Philip; but Lyfimachus afterwards called it Nicæa, in compliment to his wife, the daughter of Antipater.—Also, a town of the Locri Epicnemidii, in the Maliac gulf, according to Strabo.—Also, the ancient name of *Nice*, a town of Italy, on the confines of Liguria. It was a colony from Marseilles, situated on the sea-coast, about a league from the mouth of the Var. It held a distinguished rank among the Greek towns of the Gauls, when the Romans undertook the conquest of Provence, about 153 years B. C. The ancient Marfilians gave it the name of *Nikk*, which signified victory, in commemoration of the advantages which they had gained in this place over the Ligurians. From Strabo we learn that long before his time Nice had a number of vessels, an arsenal, and many warlike machines, of which the Romans availed themselves in the conquest of Provence. In the time of this geographer, the Marfilians were still masters of it, but they did not possess it long after the reign of Tiberius. Many ancient inscriptions prove that it was under the dominion of the Romans. But although it flourished in the time of the ancient Marfilians, it lost much of its splendour under the Roman emperors; so that by the authors of the lower empire it is merely described as the port of Nice or the castle of Nice. Its splendour and its commerce vanished together.—Also, a town of India, on this side the Ganges, on the left bank of the Hydaspes, over-against Bucephala, founded by Alexander after the victory obtained by him over Porus, upon the banks of the said river.—Also, a town of the island of Corsica, founded by the Etrurians after they had gained the empire of the sea, and taken possession of the isles adjacent to Etruria.

NICAISE, CLAUDE, in *Biography*, a man of letters, was born at Dijon in 1623. He embraced the ecclesiastical profession, and came to Paris, where he entered the university, and studied theology in the college of Navarre. In 1655 he paid a visit to Rome, where he took priests' orders, and formed connections with all the eminent literati and artists of that capital. After a residence in Italy of several years, he returned to France, where he devoted himself entirely to literary pursuits, and chiefly to correspondences with the learned of different nations. So great was his occupation of that kind, that he was regarded as the general intelligencer for all matters of lettered curiosity upon the continent. He died in 1701, at the age of seventy-eight. He had collected a numerous and well chosen library. He was author of several pieces, of which the following have been cited with applause: "De Nummo Pantheo;" "A Discourse on the Form and Figure of the Syrens;" "A Dissertation on the Schools of Athens and Parnassus," which were two of Raphael's pictures.

NICAMA, or NIGAMA, *Nega-patnam*, in *Ancient Geography*, a town to which Ptolemy gave the title of metropolis, situated near the southern mouth of the river Chaberis, on the coast of the peninsula of India, on this side of the Ganges, north of the "promontorium calligicum."

NICANDER, in *Biography*, a celebrated Greek physician, grammarian, and poet, respecting whose birth-place, and the era in which he flourished, there is a considerable variety of opinion. Suidas informs us, that he was the son of Xenophon, of Colophon, a town of Ionia; although he admits, that other writers consider him as a native of Ætolia. We have, however, the testimony of Nicander himself, that his birth-place was Claros, a little town in Ionia, near Colophon, and that he was born in the neighbourhood of the temple of Apollo. With respect to the age in which he lived, authors are not more agreed. He is commonly supposed to have flourished about the 160th

olympiad, and 140 years before Christ, in the reign of Attalus I., king of Pergamus; while others are of opinion, that he was in the zenith of his reputation in the reign of the last king of that name, Attalus Philometor, and in that of Aristonicus. According to this account he must have lived upwards of a century later than is commonly stated. He was the author of many works, but the two following alone remain, namely, the poems entitled "Theriaca," and "Alexipharmaca." In the former, he describes the effects of the bites of venomous animals; and in the latter, he treats of their antidotes. Among the works which are lost, were similar poetical pieces, entitled "Ophiaca," which related to serpents, and "Hyacinthia," which was a collection of remedies. Athenæus also cites in several places, some poetical works of Nicander upon the subject of agriculture, which have been called his "Georgics." Besides these works, he is said to have composed five books of "Metamorphoses," which were the prototypes of those of Ovid, and were closely copied in those of Antonius Liberalis; and to have written several historical pieces, especially "A History of Colophon," a work entitled "Ætolics," and a general history of Europe; so that his various knowledge seems to have merited the eulogies which were passed upon him in several epigrams, in the first book of the "Anthologia." A great number of editions of the two poems first mentioned, in Greek, and in Latin versions, have been printed, at different times and places. Eloy Dict. Hist. Hutchinson, Med. Biog.

NICANDRA, in *Botany*, named by Schreber in honour of Nicander, of Colophon, an ancient Greek poet, and priest of Apollo, who lived about the time of Attalus. His Georgics are greatly commended by Cicero, and are interspersed with various botanical remarks, though this work is for the most part lost. Of his two poems which are known and remain entire, *περι αλεξιφαρμακων*, and *περι θηριακων*, Dioscorides has made much use. These passed through various editions during the sixteenth century. Haller notices a very beautiful manuscript of Nicander preserved at Vienna. Schreb. 283. Willd. Sp. Pl. v. 2. 541. Mart. Mill. Dict. v. 3. (Potalia; Aubl. Guian. v. 1. 394. Juss. 143. Lamarck Illustr. t. 348.)—Class and order, *Decandria Monogynia*. Nat. Ord. *Gentianeæ*, Juss.

Gen. Ch. Cal. Perianth inferior, of one leaf, turbinate, thick, coloured, cloven into four, broad, concave, obtuse segments; the two opposite, outer ones larger; the two inner smaller. Cor. of one petal; tube very short; limb deeply cloven into ten, oblong, imbricated segments, incurved and rigid at the top. Nectary, a membranous, short ring, surrounding the base of the germen. Stam. Filaments ten, very short, connected with the nectary, inserted into the receptacle; anthers linear, square, acute, erect, approximated. Pist. Germen superior, ovate; style short; stigma peltate, orbicular, six-rayed. Peric. Berry roundish, six-furrowed, three-celled. Seeds numerous, very small, angulated.

Ess. Ch. Calyx turbinate, four-cleft. Corolla of one petal, deeply ten-cleft. Filaments inserted on the ring of the nectary. Berry six-furrowed, three-celled, and many-seeded.

1. N. *amara*. Linn. Syst. ed. Gmel. v. 2. 677. Willd. (Potalia amara; Aubl. Guian. t. 15.)—Native of extensive forests in Guiana, flowering in July or August, and bearing fruit in October. Root perennial, woody and fibrous. Stem simple, straight, hard, woody, knotty, the thickness of a finger. Leaves opposite, stalked, entire, smooth, narrow at the base, roundish and pointed at the end, a foot and half long, about five inches wide, with a pretuberant mid-

mid-rib underneath. *Stalks* rounded, attached to a sheath that embraces the stem. *Flowers* terminal, about twenty together on one, two or three stalks, each having a partial stalk with two scales at its origin. The *calyx* is of a golden colour. *Corolla* white. *Fruit* yellow, fleshy, the size of a cherry.

Aublet remarks that every part of the plant is extremely bitter, and that its young twigs are furnished with particles of a yellow transparent resin, which is very inflammable, and emits a sweet savour when burnt, something like Benzoin. The leaves and twigs are used for an infusion, to be given in venereal cases, or where there is a suspicion of poison, being, in a large dose, highly emetic.

NICARACOO, in *Geography*, a town of Hindoostan, in Golconda; 55 miles E.S.E. of Hydrabad.

NICARAGUA, a province of Mexico or New Spain, in the domain of Guatemala, bounded on the N. by Honduras, on the E. by the North sea, on the S. by Costa Rica, and on the W. by Guatemala, and the Pacific ocean. This is one of the most woody provinces of New Spain; but the plains are very fertile. It produces good flax and hemp, and also the wood used by the dyers in Europe, called Nicaragua wood; but little wheat. It abounds with black cattle and hogs, but sheep are scarce. Balm, cotton, sugar, American pepper, liquid amber, and turpentine, are plentiful; and together with the produce of the silver mines, enable the inhabitants to carry on a considerable trade with Panama and Nombre de Dios. Turkeys and also parrots are numerous. The country itself is so pleasant and so productive, that it has been reckoned the garden of America; the hills and sands of the rivers furnish gold, whilst the fields and woods are perfumed with odoriferous plants and flowers, inasmuch that when the Spaniards first visited it, they called it "Mahomet's Paradise." The winter in this province is rainy and tempestuous, and the summer very hot, but healthy. The natives are accounted singularly ingenious, especially as musicians and goldsmiths. The capital of this extensive province is *Leon*; which see. Granada, formerly called Nicaragua, and erroneously so denominated in our maps, is another little town, on the great lake of Nicaragua.

NICARAGUA Lake, the chief lake in Spanish North America, which is about 170 British miles in length, from N.W. to S.E., and about half that breadth. This grand lake is situated in the province of the same name, towards the south of the isthmus, and has a grand outlet, the river of St. Juan, to the gulf of Mexico; while a smaller stream is by some supposed to flow into the Pacific. Under the direction and exertions of an enterprising people, this lake might supply the long wished-for passage, in the most direct course, from the Atlantic into the Pacific. This lake is navigable for ships of the line, and the river of St. Juan is also navigable through its whole course for large ships. On the other side the space to be cut, in order to complete the communication, would not exceed, according to the best and most recent maps, 10 or 12 English miles, and in order to open a grand navigation, might cost about 200,000*l.* sterling. The lake itself would afford the inestimable advantage of a large internal port, capable of being defended by fortresses on both sides. This lake is remarkable for numerous farms on its shores, abounding in horses and beavers, each having a little port where canoes and barks arrive, and load with great dispatch. There are several picturesque islands, some of which are volcanic. The water in this lake is said to ebb and flow like the sea; it abounds with fish, but is infested with crocodiles.

NICARIA, an island of the Grecian archipelago, *an-*
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ciently called "Icaria," on account of the son of Dædalus, who fell there in the midst of his rash flight, whence, as some have supposed, the surrounding sea took the name of the *Icarian sea*, which see. (See also ICARUS.) This is an inconsiderable island; its length greatly exceeds its breadth; it is discoverable at a very great distance; but navigators make no attempt to land here, as it has no harbour. A scanty population, want of energy, a soil in several districts unfavourable, and general discouragement impressed by the government through the extent of its dominion, are circumstances little calculated to repair the disadvantage of an island, which has no places of shelter for shipping, and consequently no great means of trade; so that Nicaria may be reckoned among the most wretched islands of the archipelago.

NICASTRO, a town of Naples, in Calabria Ultra; the see of a bishop, suffragan of Reggio; nearly destroyed by an earthquake in 1638; 18 miles S. of Cosenza. N. lat. 38° 3'. E. long. 16° 37'.

NICAVA, a town of Japan, in the island of Nippon; 160 miles N.W. of Jedo.

NICAUAR, a town of the island of Ceylon; 50 miles S.W. of Trincomaly.

NICCA, a town of the island of Cherfo, in the Adriatic; 20 miles W. of Cherfo.

NICCOLI, NICCOLO, in *Biography*, a meritorious contributor to the restoration of learning in Italy, was the son of a merchant at Florence, where he was born in the year 1364. In obedience to his father's commands, he passed some of the first years of his life in commercial pursuits; but as soon as he was enabled to follow his own inclinations, he devoted himself entirely to literature. He contracted an acquaintance with all the learned men of Florence, and so desirous was he of improvement, that he went to Padua for the sole purpose of copying the Latin works of Petrarch, which were then in very high esteem. Previously to the invention of printing, transcribing manuscripts was a considerable part of the labour of a scholar, and it is said, that a great number of works, copied or corrected by Niccoli, are still extant. With these, and with others which he purchased, he formed a select and copious library for that age, and with a liberality superior to that of many collectors, he granted the free use of his stores to all who wished. He was considerably instrumental in promoting that discovery of ancient authors, which was the most important service then to be rendered to letters. Poggio has recorded the pecuniary assistance afforded to himself, in his learned researches, by Niccoli, who was also the patron of other celebrated scholars that flourished in this period: it was chiefly through his influence that Manuel Chrysoloras, Guarino Veronese, and Filelfo, were invited to Florence as public professors. The house of Niccoli was, we are informed, the common resort of the learned. Poggio introduces Niccoli as a prominent figure in his "Dialogue on the Unhappiness of Princes," and represents him as detailing the miseries of exalted rank. On this subject he dilates at considerable length, proving, from history, that the best of princes are liable to the bitterest woes incident to human nature. Gaining courage as he proceeds, he attempts to demonstrate that eminence of station is unfriendly to virtue, and shews that it has frequently happened that men who have adorned a private station by their virtues, have become the disgrace of human nature when they have been raised to the summit of power: hence he infers, that as happiness seems to be banished from the palaces of the great, if she resides any where on earth, she must be found in the abodes of private individuals, who have wisdom to set bounds to their desires, and to dedicate them-

selves to the cultivation of their intellectual powers. The conduct of these men he proposes as an object of imitation, and exhorts his friends to the study of those principles of philosophy which will render them happy in themselves, and fearless of the power, and independent of the favours of the great. Niccolo Niccoli died at the age of 73, in 1437, and Poggio pronounced over him a funeral oration, in which he gives him almost unbounded praise. His merits as a benefactor to literature cannot be disputed, and he consulted its interests after his death, by the bequest of his library to the public. This is said to have been the first public library opened since the times of antiquity; his intention, however, could not have been carried into effect, had not Cosmo de Medicis undertaken to satisfy the demands of his creditors, which were numerous. Shepherd's Life of Poggio Bracciolini. See also the article BRACCHIOLINI.

NICE, in *Geography*, a province of Italy, now subject to France, bounded on the N. by Piedmont, on the E. and S. by the state of Genoa and the Mediterranean, and on the W. by Provence, to which it was formerly annexed; lying in N. lat. 44°, and E. long. 7° 20', and being 45 miles from N. to S., and 25 to 50 from W. to E. It contains the following six districts or counties: 1. The county of "Tenda," about 12 leagues N.N.E. of Nice, consisting of mountains and agreeable vallies, with a small town of the same name, on a declivity bathed by a rivulet that has a southerly course, and runs into the sea at Ventimiglia. The passage of Tenda across the mountain is more difficult than that of mount Cenis. 2. The county of Broglia, with a small town of the same name, lying among the mountains; 30 miles N.N.W. of Nice. This county is separated from France, excepting only where the line of division runs along the summits of the mountains, by the rapid Var and the Esteron. 3. The marquise of "Dolce aqua," watered by the Navia, and fruitful in wine and oil; it has a town of the same name defended by a fort. 4. The county of "Nice," lying on the sea-coast, in 43° 45' N. lat. remarkable for the temperature of its climate. (See NICE, below.) 5. The principality of "Oneglia," 45 miles N.E. of Nice, environed by the Genoese territories, and divided into three vallies abounding in wine, oil, and fruits. Oneglia is a little trading town on the sea coast. 6. The valley of "Barcelonetta," yielding good pasture, lies at the N.W. extremity of the principality, on the frontiers of Dauphiné and Provence, ceded by France A. D. 1760. The town of the same name, seated on an eminence, was founded A. D. 1230 by Raymond Berenger. The country called Nice, formerly belonging to Italy and France, is now annexed to the latter, and forms the department of the Maritime Alps.

NICE, *Nicea*, *Nexaia*, or *Nizza*, a city and sea-port of France, and capital of the department of the Maritime Alps, situated on a rock near the foot of the Alps, at the mouth of the river Paglione, on the left bank of the Var. It contains a cathedral, eight parish churches, and thirteen religious houses. The town includes 18,475, and the canton the same number of inhabitants, on a territory of 22½ kilometres, in one commune. Towards the W. it is fortified with a wall and ditch, and defended by a castle. The streets of the old town are narrow and crooked; but those of the new town are wide and straight, with handsome houses. The suburbs, most of which are in ruins, are principally inhabited by foreigners. Its harbour is convenient for small vessels, but exposed to the south wind. The adjacent country is pleasant and delightful, the whole plain being highly cultivated with vines, pomegranates, almonds, oranges, lemons, and all kinds of vegetables. The hills are shaded to the top with olive trees, among which villas and country houses are

interpersed. Winter here is warm and agreeable; in March and April cold east and north-east winds prevail; autumn is usually wet; and summer intolerably hot. The air in general is serene, dry, elastic, and impregnated with salt. At Cimea, two miles from Nice, are the remains of a Roman amphitheatre, temple, aqueduct, bath, &c. The enjoyments furnished by this delightful country are not without their alloy. In summer the heat is intense; and reptiles and vermin abound, such as vipers, snakes, and scorpions; fleas, bugs, and particularly gnats, become intolerable nuisances throughout the year. This town was founded by the Phœceans, after they had built Marseilles, about 500 years B. C., on their return from an expedition against the Sali and the Ligurians, and was named *Nicea*, which see. It has undergone many vicissitudes in the later periods of its decline. It suffered very much in the year 1543, when it was besieged by land by the army of Francis I.; and the Turkish fleet, under Barbarossa, pressed on it by sea: it was taken, pillaged, and nearly reduced to ashes. Having previously changed masters, the citizens availed themselves of the liberty granted them by Ladislaus, to choose their own protector, and took the oath of fidelity to Amadeus VII., count of Savoy. The government was a species of democracy. The inhabitants are divided into four classes, the nobles, the merchants, the artisans, and the husbandmen, each class electing yearly a consul, and ten counsellors. In the year 1792 the French took possession of Nice, and the inhabitants seemed disposed to unite cordially with their new masters; for in September 1793, when an English vessel arrived here with a flag of truce, and a proclamation to the people, exhorting them to accept the royal constitution of 1789, the magistrates of the city replied, "that French republicans would never become slaves, and that no farther answer would be made to royalists, except from the mouths of cannon." N. lat. 43° 31'. E. long. 7° 18'.

NICE, *Council of*, in *Ecclesiastical History*, held at Nice in Bithynia A. D. 325, convened by Constantine in order to settle differences and controversies which had taken place among the Christians, of which Eusebius has given an account. It was summoned by letters conveyed by Constantine in 324 into the several provinces of the empire, together with orders for furnishing the bishops with beasts, or carriages, and for bearing the expences of their journey. The bishops who met in this council were, according to Eusebius's statement, more than 250, beside presbyters and deacons, acolythists and others, whose number could not be easily counted. We have different estimates of the number of bishops who attended on this occasion. The number generally allowed is that of Theodoret, who reckons them at 318. How long this council sat is not absolutely certain. Some have given it a permanence of two or three years; but most learned moderns are of opinion, that it sat somewhat above two months, beginning the 19th of June and rising the 25th of August. The three points debated and determined in this council were the Arian controversy, the time of keeping Easter, and the affair of Meletius in Egypt. Nothing now remains of this council, but the creed, the synodical epistle, and 20 canons. This council has received great commendations from many, both ancients and moderns. Epiphanius reckoned the two great benefits which the church received from divine providence by means of Constantine, to have been a determination of faith against Arians, and a certain rule for keeping Easter. Moderns have considered this council not only as the first ecumenical council, but also as the most celebrated council, since the time of the Apostles. It is the most famous, and the most venerable of all councils; than

than which the church has nothing more illustrious. It has, however, been censured by some of former, as well as later ages. As for the Meletian controversy or schism, which was to be terminated by this council; it requires no particular mention. As to the time of keeping Easter, the council determined that it should be observed by all on the Sunday which immediately followed after the 14th of the moon, that happened next after the vernal equinox; which equinox happened that year on the 21st day of March. (See EASTER.) But the principal determination of the council of Nice relates to the Arian controversy. On this determination, the learned, impartial, and candid Lardner makes the following remarks. 1. That their decisions had not the intended effect; peace and unity were not thereby restored to the churches. Notwithstanding the professions made by many of a high veneration for councils, men do not value them any farther, than they countenance their own particular opinions: and if they are under no restraints of external force, they contradict their decisions without scruple. 2. No man, or number of men separate, or united in council, since the time of Christ and his apostles, have any right to decide in matters of faith. It is inconsistent with the respect due to Jesus Christ, to attempt it: unless they can shew themselves to be inspired, and work miracles, to manifest evidently a divine commission. If such a case should happen, which is very unlikely, what such persons propose must be tried and examined by the doctrine of the gospel, delivered in the New Testament. 3. The introducing of force and authority in matters of a spiritual nature, is subversive of true religion and virtue. The council of Nice unquestionably introduced authority and force in the church, and the affairs of religion. Or if authority had been introduced before, they now openly countenanced it, and gave it a further sanction. 4. When this council met, instead of deciding by their authority, and enforcing by wordly menaces and recompences any speculative doctrines, they should rather have recommended forbearance and moderation to all parties. See COUNCIL.

NICEA, in *Geography*, a town of European Turkey, in the Morea; 18 miles E.N.E. of Mistra.

NICENE CREED. See CREED.

NICEPHORIUM, in *Ancient Geography*, Racca, a town of Asia, in Mesopotamia, according to Ptolemy, who places it between Maube and Maguda. Pliny says, that Alexander availed himself of the advantageous situation of this place for building a town; and Steph. Byz. says, that it was afterwards re-established by the emperor Constantine. It was situated on the eastern bank of the Euphrates, near the place where the Bilicha discharged into this river. M. d'Anville conceives it to have been the place which was called Callinicum or Callinicus, and under the emperor Leon, Leontopolis.—Also, a town of Asia Minor, near the Propontide, which, according to Arrian, was a fortified place, in which were temples.

NICEPHORIUS, a river of Armenia, which, according to Tacitus, watered and guarded the town of Tigranocerta, and discharged itself into the Tigris.

NICEPHORUS I. in *Biography*, emperor of the East, surnamed "The Logothete," was great treasurer and chancellor of the empire at the time when a revolt of the nobility from the empress Irene dispossessed her of the throne, A.D. 802. Nicephorus was invested with the purple, and solemnly crowned at St. Sophia, while Irene was first confined to a monastery, and afterwards banished to the isle of Lesbos. In a short time after his accession he made a treaty with the emperor Charlemagne, and having suppressed a revolt excited by Bardanes, the governor of one of his pro-

vinces, he strengthened his throne by the association of his son Saturacius. The emperor now declared his intention no longer to pay the accustomed tribute to the Saracens; the caliph Haroun-al-Rashid announced his determination of marching an army to enforce it, and accordingly made an incursion into Phrygia. Nicephorus, on this occasion, was completely defeated, and with difficulty made his escape. Nicephorus made another attempt to free himself from this bondage, but after a fruitless, and even a disastrous struggle, he agreed to the most humiliating terms, viz. to pay a yearly tribute in coin, stamped with the image of the Saracen, and not to repair his demolished fortresses. A violation of this last condition produced a new invasion, in which the Saracens ravaged the provinces with more cruelty than before. These public calamities were aggravated by internal discontents and conspiracies, which were punished by the emperor with extreme rigour, and caused his reign to be a perpetual scene of suspicion and tyranny. The peace of the empire was disturbed in 809 by a new enemy, who invaded it on the opposite side. The Bulgarians entered Mœsia, and surprising the city of Sardica, put the whole garrison to the sword. On the approach of the emperor they retired with their booty beyond his reach. Two years after this, Nicephorus, determined to revenge the insult, and disable them from future hostilities, penetrated to the centre of the country, and ravaged it in a merciless manner with fire and sword. This conduct, however, drove the enemy to despair, and collecting all his force, he made an unexpected attempt upon the emperor's camp, which he forced, and Nicephorus, with his chief officers, and the greater part of his army, were slain. Not satisfied with the death of the emperor, the barbarian conqueror caused his head to be cut off and exposed on the point of a spear; and his skull, set in gold, served afterwards for his usual drinking cup. This catastrophe took place in July 811. By monkish historians, Nicephorus is represented as a monster of avarice, cruelty, and debauchery. To this they add impiety, which he manifested by his favour to heretics, and his contempt for the church of Rome.

NICEPHORUS II., PHOCAS, emperor of the East, was the son of Bardas Phocas, and commander of the imperial army in Asia. Nicephorus was brought up to the army, and succeeded his father in the chief command in Asia. He defeated the Saracens on various occasions, and in the reign of Romanus recovered the whole island of Crete in a series of actions of seven months continuance. After this he was sent against the Saracen caliph of Syria, whom he defeated, and then captured the important city of Berzæ. On the death of Romanus he returned to Constantinople, where he obtained the honour of a triumph. Finding that he was suspected of ambitious designs by the prime-minister Joseph, he requested a private audience with him, at which he pretended an aversion for all worldly dignities, and a resolution to retire to a monastic life, shewing him, at the same time, a hair cloth which he wore next his skin. The minister, duped by his hypocrisy, suffered him to return to the army of the East, where his fellow-commanders, Zimisces and Curcuas, persuaded, or compelled him to assume the title of emperor, which was conferred upon him in the year 963. He returned to Constantinople, where he was crowned by the patriarch. His warlike disposition was manifested in the continual assaults which, in person or by his generals, he made upon the Saracen power. He sent Manuel, the natural son of his uncle Leo, with a powerful army, on an attempt to expel the Saracens from the island of Sicily, but the unskillfulness of the leader caused his total destruction. His lieutenants

tenant and former comrade, John Zimisces, succeeded better against the same enemy in Cilicia and Cyprus. The emperor, having in the fourth year of his reign besieged and reduced the cities of Mopsuestia and Tarsus, invaded Syria, took several towns, and invested Antioch itself; but on the approach of winter he was obliged to quit it, and return to his capital. Antioch was, however, in a short time afterwards surprised by one of his generals. This career of victory, splendid as it was, produced unpopularity at home, on account of the new taxes which he was forced to impose, and at the same time he offended his generals by the suspicions with which he requited their services. At length a conspiracy was formed against him, and by the contrivance of the empress, Zimisces, with a band of assassins, was admitted, by night, into the palace, and Nicephorus, who had once been honoured with the title of the "Morning Star," was cut off A.D. 969, in the 57th year of his age, and the seventh of his reign. Univer. Hist. Gibbon, vol. x.

NICEPHORUS III., BOTONIATES, emperor of the East, was a general under Constantine Ducas, when he was defeated and taken prisoner in an invasion of the Scythian Uzians. He was commander of the Asiatic forces of the empire, when Michael Ducas encouraged him to revolt, and make an alliance with the Turks, whom he had been sent to oppose. He was solemnly recognized as emperor, and crowned by the patriarch in March 1078. Alexius Comnenus was employed by him against three competitors, viz. Urfellius, Bryennius, and Basilacius. All these he successively reduced, and Nicephorus strengthened his authority by marrying Mary, who had been the wife of Michael Ducas. He was now advanced in years, and having no male issue, he was persuaded, by two favourites, to nominate in his testament for his successor, a youth who was his relation. The empress, however, anxious that her son should succeed to the empire, determined, with the assistance of Alexius and Isaac Comnenus, to depose Nicephorus, which she quickly effected, and the emperor quitted the throne, after a reign of three years. He retired to a monastery, where he took the habit, and ended his days in obscurity and peace. Univer. Hist. Gibbon, vol. x.

NICEPHORUS, patriarch of Constantinople in the beginning of the ninth century, was a native of that city, the son of Theodorus, secretary to the emperor Constantine Copronymus. He became confidential secretary to the emperor, and his mother Irene. He attended in his official capacity at the second council of Nice in the year 787, where his talents and influence were zealously exerted in defence of image-worship. The manners of a court were ill adapted to his mind, and he withdrew into a monastery on the Thracian Bosphorus, but not as a member of the religious community. In 806, upon the death of the patriarch Taracius, he was elected his successor in that dignity while a layman. In the year 814, an edict having been promulgated by the emperor Leo, the Armenian, for the suppression of the worship, the patriarch made use of all the means in his power to prevent it from being carried into execution. For this he was banished, and he spent a great part of his exile in a monastery which had been founded by himself in the island of Propontis, where he was confined till his death in the year 828. He was a man of strong natural abilities, and he had acquired high intellectual endowments. By the Greek and Latin churches he is honoured as a confessor. He was author of several works, of which the most considerable is "An Abridgment of History," commencing with the death of the emperor Mauritius, and ending in the reign of Irene. Another work attributed to him, is "A Chronological Catalogue of all the Patriarchs, Kings, and

Princes of the Jews, Kings of Persia and Macedon, Roman Emperors, &c." He also wrote three books, entitled "Antirrhetics," against the council held at Constantinople, under Constantine Copronymus, which abolished the use of images. He is supposed, by Lardner and others, to have been the author of "The Stichometry," which contains a catalogue of the books of sacred scripture, which is of use to shew that the Jewish canon was generally esteemed sacred by Christians, and that the other books of the Old Testament, which are now deemed "Apocryphal," were not of equal authority, though sometimes read in the churches, and quoted by Christian writers. It affords likewise strong evidence to prove, that there never were any Christian writings esteemed to be of equal authority with those which are now received by us as sacred and canonical. A letter of this patriarch to pope Leo, containing his confession of faith, may be found in the seventh volume of the Collect. Conciliorum. Lardner. Moreri. Gen. Biog.

NICEPHORUS, CALLISTUS, the son of Callistus, surnamed *Xanthopulus*, a learned monk of Constantinople, who flourished in the 14th century, was a very studious man, and was for many years employed in the diligent perusal of the books in the celebrated library belonging to the church of St. Sophia. While he was a very young man, he undertook to write, in the Greek language, "A New Ecclesiastical History," collected out of Eusebius, Socrates, Sozomen, and others, and he completed the work before he was thirty-six years of age. It was addressed to the emperor Andronicus Palæologus the elder, and divided into twenty-three books, extending from the birth of Christ to the death of the emperor Leo, the philosopher, in the year 911. Eighteen only of these have reached our times, which bring the history to the death of the emperor Phocas, or the year 610. On account of the elegance of the composition, the author has been styled the "ecclesiastical Thucydides," while others, from the marvellous tales and fables which are interspersed in it, have given him the name of the theological Pliny. It is extremely useful on account of the light which it throws on many important facts in ecclesiastical history. The only MS. of it yet discovered belonged to the library of Matthias, king of Hungary, at Buda, where, on the capture of that city, it became part of the plunder collected by a Turk, who carried it to Constantinople, from whence it passed to the Imperial library at Vienna. It has undergone several impressions. Besides this work, Nicephorus wrote "A Catalogue of the Constantinopolitan Emperors," and another of the Patriarchs, both in Greek Iambic verse; and "An Abridgment of the Scriptures," in the same kind of verse. Dr. Hody has attributed to him a small piece, which he published in Greek and Latin, during his controversy with Mr. Dodwell, under the title of "Anglicani Schismatis Redargutio." Gen. Biog.

NICEPHORUS GREGORAS, one of the Byzantine historians, who flourished in the 14th century, was a favourite of Andronicus Palæologus the elder, who made him librarian of the Constantinopolitan church, and sent him on an embassy to the prince of Servia. He followed that emperor after his deposition, and was with him at his death. After this he went to the court of Andronicus the younger, where he was the cause of the refusal of the Greeks to enter into a conference with the legates of pope John XXII. In the disputes that took place between Barlaam and Palamas, he took the part of the former, whom he warmly supported in the council held at Constantinople in 1351. For this he was thrown into prison, and was not liberated till the return of John Palæologus. Nicephorus wrote eleven books of the Byzantine history, comprehending a period of 145 years, from

from Theodore Lascaris I. to the death of the younger Andronicus in 1341. This was printed at Basil in 1561, with a Latin version, by Jerome Wolff. Gregoras also wrote the life of his uncle John, metropolitan of Heraclea, and he composed *Scholia* on Synesius "De Infomniis," which have been published, besides other pieces still in MS. Moreri.

NICERON, JOHN FRANCIS, a French mathematician in the seventeenth century, was born at Paris in the year 1613. At a very early age he displayed a love of learning, and by the progress which he made in his elementary studies, afforded a fair promise of future excellence. At the age of nineteen he entered the order of Minims, and it was soon discovered that his genius was decidedly in favour of the mathematical sciences, to which, after he had completed his theological course, he devoted all the time that was not necessarily occupied by the duties of his profession. The science of optics was that which principally engaged his attention, and his performances afforded satisfactory evidence of his profound skill in that branch of natural philosophy. He became acquainted with Des Cartes, but their intimacy was but of short duration, as Niceron died at the early age of 33, in the year 1646. This event was regarded as a considerable loss to the republic of letters. He was author of many works, of which the following may be mentioned: "Interpretation of Cyphers;" "Curious Perspective, or artificial Magic produced by the wonderful Effects of Optics, Catoptrics, and Dioptrics," which was introductory to another on the same subject, but much larger, entitled "Thaumaturgus Opticus, five, admirandæ Optices, Catoptrices, et Dioptrices, Pars prima, de iis quæ spectant ad visionem directam," which he left unfinished.

NICRON, JOHN PETER, a man of letters, was born at Paris in 1685: he entered into the congregation of Barnabites, and became in due time professor of the languages, and then of theology. He took priests' orders in 1708; but in 1716 he was called to reside at Paris, where he henceforth occupied himself in literary pursuits, to which he had ever been warmly attached. Besides the ancient learned languages, he was well acquainted with the principal modern ones of Europe, and some of his early publications were translations from the English. The work by which he is principally known, is entitled "Mémoires pour servir à l'Histoire des Hommes illustres dans la République des Lettres, avec un Catalogue raisonné de leurs Ouvrages." The first volume of this publication was given to the world in 1727, and the others were printed in succession to the forty-third, but the last three were not wholly the production of Nicron. The author gave the title of *illustrious men* to a great number of persons having no claims whatever to celebrity, but his researches into the history of publications are reckoned both curious and useful. Nicron died at Paris in 1738. He was extremely amiable in his private character, and though his time was chiefly spent in the retirement of deep study, yet when in company he possessed a fund of cheerfulness and animation. His eulogy may be found in the fortieth volume of the memoirs above-mentioned, which was written by the abbé Goujet. Moreri.

NICETAS, ACHOMINATUS, surnamed *Choniates*, a modern Greek historian, was born at Chone, in Phrygia, and lived, in the early part of the 13th century, a dignified station in the court of Constantinople. At the capture of that city by the Franks, in 1204, he withdrew, with a young woman whom he rescued from the enemy, to Nice, in Bithynia, and married her. He died in 1206. He is known as the writer of a period of Byzantine history from the death of Alexius Comnenus, where Zonaras ceases, to the year 1203, being 85 years, in 21 books, which are still

extant. They were printed by Jerome Wolff at Basil in 1557, and were inserted in the Louvre edition of the Byzantine historians of 1647. The history is valued on account of the truth of its facts. Banduri, in his "Imperium Orientale," has printed a small piece by Nicetas on the statues melted down by the Latins when they took Constantinople. To Nicetas also have been attributed the five first books of the "Treasure of the Orthodox Faith," translated by Morel, and printed in 1580. Moreri.

NICETAS, surnamed *Serron*, bishop of Heraclea in the eleventh century, was author of a commentary upon the oration of Gregory Nazianzen; of many original works, chiefly relating to the Holy Scriptures; and of "Canonical Answers" to questions proposed by a certain bishop, named Constantine, which John Leunclavius published in Greek and Latin.

NICETERIA ATHENAS, Νικητρία Ἀθηνῶν, in *Antiquity*, an Athenian solemnity in memory of Minerva's victory over Neptune, when they contended which of them should have the honour of giving a name to the city afterwards called Athens.

NICHABURG, in *Geography*, a town of Persia, in Khorasan, famous for a mine of turquoise stones in its neighbourhood; 30 miles S. of Mefchid.

NICHE, in *Architecture*, a cavity, or hollow place, in the thickness of a wall, to place a figure or statue in.

The word comes from the Italian *nicchia*, *shell*; because the statue is here inclosed in a shell; or, perhaps by reason of the shell with which the tops of some of them are adorned.

Niches are made to partake of all the segments under a semicircle. They are sometimes at an equal distance from the front, and are parallel or square on the back with the front line; in which case they are called square recesses, or square niches.

The larger niches serve for groups of figures; the small ones for single statues, and sometimes only for busts.

Great care must be taken to proportion the niches to the figures; and that the pedestal of the figures be proportioned to the niches.

Niches are sometimes made with rustic-work.

NICHE, *Angular*, that formed in the corner of the building.

NICHE, *Cul de four of a*. See CUL.

NICHE, *Ground*, that which, instead of bearing on a massive, has its rise from the ground; as the niches of the portico of the Pantheon at Rome. Their ordinary proportion is to be two diameters in height, and one in width.

NICHE, *Round*, is that whose plan and circumference are circular.

NICHE, *Square*, that where they are square.

NICHED COLUMN. See COLUMN.

NICHILIANISTÆ, in *Church History*, heretics who maintained that Christ had no being.

NICHILS. See NIHILS.

NICHILS, *Clerk of the*. See CLERK.

NICHOLAS I., pope, in *Biography*, called the Great, a native of Rome, the son of one Theodore, was ordained sub-deacon by pope Sergius II., and deacon of the Roman church by pope Leo IV. So high was the reputation which he acquired in these offices, that upon the death of pope Benedict III. in 858, he was elected to fill the vacant dignity. When the emperor Lewis II., who had lately left Rome, heard of this event, he returned to that city, and assisted in person at the coronation of the new pontiff.

pontiff. Some days afterwards, being told that the pope, attended by the Roman nobility, was coming to visit him, he went out to meet him, and after dismounting took hold of the pope's bridle, and condescended to lead his horse for some distance on foot, as he did also at the pope's departure. One of the first objects of importance which engaged the attention of the new pope, was the state of affairs at Constantinople, which had divided the eastern bishops into two parties, and seemed to furnish him with a favourable opportunity of exercising his power and authority over that rival see. The emperor Michael, incensed against the patriarch Ignatius, on not finding him sufficiently obsequious to his pleasure, commanded him to be driven from his see, declared lawfully deposed, and sent into exile. At the same time Photius, who was universally regarded as a man of extraordinary abilities, and as the rival of the ancients themselves in every branch of literature, was elected his successor, and as he was at that time a layman, he was hurried through the ecclesiastical degrees required by the canons, and consecrated in six days. These events occasioned no little disturbance in the eastern churches, some of them adhering to Ignatius, and others as warmly attached to Photius. At a council of bishops held at Constantinople in the year 860, Ignatius was declared unworthy of the patriarchal dignity, and accordingly deposed and excommunicated. By an opposite party, Photius met with a similar treatment. Finding the bishops thus divided, Photius applied to the pope to procure an approbation of his election. It is not compatible with the limits assigned to articles of this sort, to enter at large into this controversy, but we may briefly observe, that in a council held at Rome in 863, pope Nicholas excommunicated Photius, who had supplanted Ignatius in the see of Constantinople, as an usurper. When information of this procedure was brought to the emperor Michael, he sent a letter to his holiness, filled with the severest reproaches and menaces, to which Nicholas returned a long reply, consisting of answers to the various articles, or blasphemies against God and St. Peter, contained in it. All intercourse from this time was broken off between Constantinople and Rome, and Photius proposed to the emperor the assembling of a council at Constantinople for the purpose of deposing Nicholas. This was agreed to; a council was convened, and before this assembly the pope was arraigned of innumerable crimes, and being pronounced guilty, was solemnly deposed as altogether unworthy of the episcopal dignity, and it excommunicated all those who should venture to communicate with him. Photius also wrote a circular letter to the patriarchs and bishops of the East, charging the Roman church with several erroneous doctrines, and various practices repugnant to the canons of the universal church, and exhorting them to concur with him for the purpose of reforming that corrupted church. The task of answering these charges Nicholas devolved on Hincmar and the Gallican bishops, but, in the mean time, a change of affairs in church and state took place, in consequence of the murder of the emperor Michael, and Basil's becoming head of the empire. For on the very next day after this event, Basil ordered Photius to be deposed and confined in a monastery, and then sending for Ignatius, he reinstated him in the patriarchal dignity. Of this important change an account was immediately sent to Rome, but Nicholas did not live long enough to enjoy the satisfaction which the tidings of it would have afforded him. He died in the year 867, after he had presided over the Roman church nine years and a half. He was reckoned a person of considerable abilities and learning, and particularly excelled as a canonist. By some writers he has been compared with Leo I. and Gregory I., (see their articles.)

and pronounced worthy with them of the surname of GREAT. He is commended by Anastasius for his charity to the poor, and for the magnificent presents which he made to the churches of Rome, particularly to that of St. Peter. The public works of his pontificate, were the repairing of an aqueduct which conveyed water to the Vatican basilic, and the rebuilding of the city of Ostia, which was strengthened with new works, to resist the sudden attacks of the Saracens. About a hundred of his letters have reached our times, which are inserted in the eighth volume of the Collect. Conciliorum; they have been likewise published separately at Rome.

NICHOLAS II., pope, whose original name was Gerard, was a native of Burgundy, became bishop of Florence; and in January 1059 he was raised to the pontificate, when he took the name of Nicholas II. Previously to this, John Mincius had aspired to the papal throne under the title of Benedict X., but finding himself too weak to dispute the claims of Nicholas, he threw himself at his feet, entreated his forgiveness, and protested that he had been compelled to accept the dignity which he now most readily laid aside. Nicholas accordingly absolved him from all guilt, but divested him of his ecclesiastical functions, and obliged him to spend the remainder of his days in the church of St. Mary at Rome, where he was admitted only to lay-communion. In the first year of the pontificate, Nicholas convened a council, to which all the bishops of Italy, France, and Germany were invited, in order to take into consideration the best means for suppressing the opinions of the famous Berenger relating to the Eucharist. (See the article BERENGER.) By the same council, a decree was passed concerning the election of the pope, confining it to the cardinals, and only leaving to the people, the clergy, and to the emperor, the power of confirming the election which they had made. Several canons were also made in it against simony, incestuous marriages of priests, and various abuses, which preceding popes had endeavoured, in vain, to extirpate. During the same year in which this council was held, the pope sent Peter Damian, cardinal bishop of Ostia, and Anslem, bishop of Lucca, with the character of his legates, to assist Guido, archbishop of Milan, in correcting several abuses which prevailed in that church, and a few days after the council broke up he set out for Melfi, the capital of Apulia, where he presided in person, at a council which passed many severe laws for the same purpose. While he was at Melfi, he received an embassy from the famous Robert Guiscard, the Norman, who had made himself master of the whole of Apulia, and spread his conquests over the greatest part of Calabria. After a few conferences, it was agreed between them, that the pope should absolve the Normans from the excommunication which they had incurred, and confirm to Robert and his heirs the dukedoms of Apulia and Calabria, which he had conquered from the Greeks, and also the island of Sicily, after he should expel the Greeks and Saracens out of it. It was also agreed, that the pope should confirm to Richard of Aversa, and his heirs, the city and principality of Capua, out of which he had lately driven the lawful prince. On the other hand, Robert and Richard agreed to acknowledge themselves vassals of the apostolic see, to swear an inviolable allegiance to pope Nicholas and his successors, and to pay yearly tribute as a mark of their subjection. From Melfi the pope proceeded to Beneventum, where he held another council, and he then set out on his return to Rome, attended with a numerous body of Normans, who obliged the inhabitants of Præneste, Tusculum, and Nomentum, to submit to the Roman see, from which they had revolted; and these warriors also destroyed the strong holds, and

and put an end to the power of the many petty tyrants that surrounded the city of Rome on all sides. In the year 1060, Nicholas sent Stephen, cardinal priest, into France, as his legate, to reform the abuses which prevailed in the Gallican church, and had been connived at by the bishops in those parts. In the following year Nicholas held a council in the Lateran palace, at which were present Aldred, archbishop of York, and the bishops elect of Wells and Hereford. Aldred had made a journey to Rome, that he might receive the pall at the pope's hands, who refused to grant it, but upon the condition that Aldred should resign the see of Worcester, which he was desirous of retaining with the higher preferment. When this council broke up, Nicholas went to Florence, where he died the same year, after a short pontificate of two years and a half. He is described by cardinal Damian as a man of learning, of a very lively genius, and of a great resolution in the pursuit of any undertaking on which he had determined. He says, he was chaste beyond suspicion, and that his benevolence knew no bounds. Nine of his letters are still extant; one of which is directed to Edward the Confessor, king of England, and contains a confirmation of the privileges granted to the church of Westminster, and the rest chiefly relate to the ecclesiastical affairs of France. They are inserted in the ninth vol. of the Collect. Conciliorum.

NICHOLAS III., pope, whose family name was John Cajetan, was a native of Rome, and descended from a branch of the noble family of the Ursini. He was elected to the papacy in November 1277, and immediately after his election he repaired to Rome, in order to be ordained, and upon his being crowned, he took the name of Nicholas, from the saint who gave the title to his cardinalate. Before his coronation he wrote to Rudolph, in order, if possible, to prevent the war which threatened to break out between him, and Charles king of Sicily. He hoped to persuade the emperor to suspend his intended march into Italy, and to refer the subject in dispute to the judgment of the apostolic see. In the year 1278, ambassadors arrived at Rome from the Greek emperor Michael Palæologus, and his son Andronicus, to confirm the union agreed upon at the council of Lyons between the Greek and Latin churches. On this occasion, Nicholas received them in the most honourable manner, and they swore to all the articles which were subscribed by the former ambassadors. In the same year, Rudolph confirmed to the popes all the grants made, or which were pretended to have been made, by former emperors and the apostolic see; he also obtained the concurrence of all the electors of the empire to his diploma of confirmation. In return for this liberality, the pope obliged the king of Sicily to resign his vicariate of Tuscany, declaring that the office was annulled by the lawful election of Rudolph to the dignity of king of the Romans. By depriving Charles of his power in Tuscany, Nicholas not only rendered an acceptable service to the emperor, but also gratified the hatred which he had conceived to the king of Sicily. After this he obliged Charles to resign the dignity of senator of Rome, conferred upon him by pope Clement IV., and then issued a bull, forbidding any emperor, king, prince, duke, marquis, count, or baron, &c. from being elected hereafter to that office. The same bull ordained that the senatorial dignity should not be conferred on any person for life, but only for one year; at the end of which another should be chosen, unless the pontiff for the time being thought fit to continue the former in his dignity. But, notwithstanding this bull, Nicholas got the Romans to choose him senator for life. So far was he carried by his hatred to king Charles, that he became a party in projecting

that barbarous conspiracy formed by John of Procida, and Peter, king of Arragon, to drive Charles out of the island, which is known by the name of the "Sicilian Vespers." Before this conspiracy was ripe for execution, he died at Suriano, near Viterbo, in the year 1280, after a pontificate of two years, and almost nine months. He is praised on account of his excellent moral qualities; for his liberality to the poor, and the encouragement of learning and learned men; but he carried the practice of nepotism to an extravagant excess, bestowing all the best and most lucrative employments upon his own relations. He granted many privileges to the religious orders, particularly to the Franciscans, and in the year 1279, published that famous bull, called "The Constitution EXIIT," from the first word in it, which confirmed the rule of St. Francis, and contained an accurate and elaborate explication of the maxims it recommended, and the duties it prescribed. By this edict, the pontiff renewed that part of the rule which prohibited all kinds of property among the Franciscans, every thing that bore the least resemblance of a legal possession, or a fixed domain; but he granted them the use of things necessary, such as houses, books, and other conveniences of that nature, the property of which, in conformity with the appointment of Innocent IV., was to reside in the church of Rome. To Nicholas III. is attributed a treatise "De Electione Dignitatum;" and five of his "Letters" are given in Wadingi Annal. Minor.

NICHOLAS IV., pope, formerly known by the name of Jerome Ascoli, descended from humble parents, was born at the town whence he took his surname, situated in the marche of Ancona. He entered, at an early age, into the order of Minorites, and acquired such reputation by his learning and exemplary life, that he was raised to the post of general of the fraternity. Before he had attained to this honour, pope Gregory X. sent him on a mission to Constantinople, for the purpose of bringing about a reconciliation and union between the Greek and Latin churches, and from thence into Tartary, to promote the conversion of infidels. Afterwards he was created cardinal by pope Nicholas III., by whom, and by Honorius IV., he was employed on various missions. By Martin IV. he was preferred to the bishopric of Palestrina, and on the death of Honorius IV. he was raised to the high dignity of pope. At his coronation, out of gratitude to Nicholas III., who had created him a member of the sacred college, he took the name Nicholas IV. Soon after his election he interested himself with great zeal in the cause of Charles, prince of Salerno, who was kept prisoner by Alphonfus, king of Arragon, and he sent legates to that monarch to treat about the prince's liberty, and also to summon Alphonfus to appear at Rome within a limited time. Alphonfus made his peace, but dying almost immediately afterwards, his brother James, who succeeded him, refused to ratify the treaty. At length, in 1292, Nicholas, finding that he paid no regard to his repeated admonitions to surrender the island of Sicily to Charles, solemnly excommunicated him, and all the Sicilians who adhered to him. The pope was equally zealous in ecclesiastical affairs as in political. Besides maintaining the pretensions and privileges of the church with the most resolute zeal, and, indeed, obstinate perseverance, he dispatched missionaries to propagate the Catholic faith among the Sclavonians, the Tartars, the Armenians, and other Eastern nations, and he addressed letters in defence of it to the emperor of Ethiopia. But the object which seemed to occupy his attention more than every thing else, was the desperate state of the Christians in the East, who were now reduced to the greatest extremities of weakness
and

and misery. Tripoli was taken in 1289, and all the inhabitants put to the sword, or carried into captivity. Ptolemais shared the same fate, which so alarmed the inhabitants of Tyre, Sidon, and the other cities in Syria, that they transported themselves to the island of Cyprus. Thus was the Holy Land irrecoverably lost, nothing being left to the Christians of the East but this island and the Lesser Armenia. Nicholas, to repair these losses, endeavoured to set on foot a general crusade. His efforts were vain, and he felt so much mortification at the loss of Palestine, that it was thought greatly to contribute to hasten his death, which took place in April, 1292, after he had presided little more than four years over the Roman church. He is highly commended by contemporary writers for his humility, good temper, and contempt of all worldly grandeur. He was a man of learning, and encouraged learning in others. On a magnificent mausoleum which pope Sixtus V. erected to his memory, it is recorded to his praise, that men of probity and men of learning were his only relations. He was author of "Commentaries" on some parts of the Scriptures, and of several "Sermons." His "Constitutio pro Benedictinis" was published at Paris in 1519. Some of his "Letters" have been published in the "Annales" of Bzovius, and Wadingus.

NICHOLAS V., pope, originally known by the name of Thomas of Sarzana, was the son of a physician at Sarzana, a small town on the borders of Tuscany, and the republic of Genoa, whence he derived his surname. His promising talents and early love of learning attracted the notice of cardinal Nicholas Albergati, who took him under his protection, and supplied him with whatever was necessary for pursuing his studies at the university of Bologna. Here he applied to the different branches of academical learning with extraordinary diligence and success, and acquired the character of being one of the most learned divines and able disputants of his time. Being introduced to the court of Eugenius IV., he recommended himself to the good opinion and esteem of that pontiff, who employed him in all the disputes between the Latins and Greeks at the councils of Ferrara and Florence. On these occasions he acquitted himself very ably as a scholar, divine, and man of prudence, and his merits were rewarded, in the year 1445, by his promotion to the bishopric of Bologna. In 1446 he was promoted to the purple, and in the following year he was elevated to the papal throne by the unanimous voice of the cardinals met to choose a successor to Eugenius IV. The coronation of the new pope took place on the 19th of March, when he assumed the name of Nicholas, out of gratitude to Nicholas Albergati. Immediately after his elevation to the papal dignity, he sent notice of the event to all the Christian princes, acknowledging himself to be quite unworthy of the high honour to which he had been raised, he said, against his will, and from which he was ready to retire, if such resignation was thought necessary or expedient for the good of the church. It was during the pontificate of Nicholas that the sixth jubilee was celebrated at Rome, and though the city was crowded with pilgrims during the whole year, yet, by the prudent regulations of the pope, they were furnished with all necessary supplies upon reasonable terms, and all disorders and quarrels were prevented. It was, however, at this festival that an accident happened which gave him great concern. As the crowd one day was passing over the bridge of St. Angelo, it broke down, by which more than two hundred persons were either drowned or trampled to death. In the year 1453, Nicholas received intelligence of the capture of Constantinople by Mahomet II. Some historians mention this fact as the greatest affliction that befel the

pope, but Gibbon, speaking on the subject, says, "Some states were too weak, and others too remote: by some the danger was considered as imaginary, by others as inevitable: the western princes were involved in their endless and domestic quarrels; and the Roman pontiff was exasperated by the falsehood or obstinacy of the Greeks. Instead of employing in their favour the arms and treasures of Italy, Nicholas V. had foretold their approaching ruin, and his honour seemed engaged in the accomplishment of his prophecy. Perhaps he was softened by the last extremity of their distress, but his compassion was tardy: his efforts were faint and unavailing; and Constantinople had fallen before the squadrons of Genoa and Venice could sail from their harbours." From this time he spent the remainder of his pontificate in endeavours to allay the civil wars and commotions which took place in Italy, to reconcile the Christian princes who were then at war with one another, and to unite them in one league against the enemies of the Christian church. In his efforts he was completely unsuccessful, and the disappointment is said to have hastened his death, which happened in 1455, after he had completed the eighth year of his pontificate. "The fame of Nicholas V.," says the author just quoted, "has not been adequate to his merits. From a plebeian origin, he raised himself by his virtue and learning: the character of the man prevailed over the interest of the pope; and he sharpened those weapons which were soon pointed against the Roman church. He had been the friend of the most eminent scholars of the age: he became their patron; and such was the humility of his manners, that the change was scarcely discernible either to them or to himself. If he pressed the acceptance of a liberal gift, it was not as the measure of desert, but as the proof of benevolence: and when modest merit declined his bounty, "accept it," he would say, with a consciousness of his own worth, "you will not always have a Nicholas among you." The influence of the holy see pervaded Christendom; and he exerted that influence in the search, not of benefices, but of books. From the ruins of the Byzantine libraries; from the darkest monasteries of Germany and Britain, he collected the dusty manuscripts of the writers of antiquity; and wherever the original could not be removed, a faithful copy was transcribed, and transmitted for use. The Vatican, the old repository for bulls and legends, for superstition and forgery, was daily replenished with more precious furniture; and such was the industry of Nicholas, that in a reign of eight years he formed a library of 5000 volumes. To his munificence the Latin world was indebted for the versions of Xenophon, Diodorus, Polybius, Thucydides, Herodotus, and Appian; of Strabo's Geography; of the Iliad; of the most valuable works of Plato and Aristotle; of Ptolemy and Theophrastus, and of the fathers of the Greek church. The authorities of the foregoing articles of the popes Nicholas are Gibbon; Bower's Hist. of the Popes; and Moreri.

NICHOLAS, EYMERICUS, a famous Spanish inquisitor, was born at Girone, in Catalonia, about the year 1320. He embraced the monastic life in the order of St. Dominic, and, after distinguishing himself as a preaching friar, was made inquisitor-general of the kingdom of Arragon in the year 1356, by pope Innocent VI. In the year 1371 he came to Avignon, and was created his chaplain and judge of heresies by pope Gregory XI. He died at Girone in 1393, having held the post of inquisitor-general during nearly forty-four years, and when he was about eighty years of age. He was author of an extraordinary work, entitled "*Directorium Inquisitorum*," divided into three parts. The *first* part treats concerning articles of faith: the

the *second* respecting the punishment of heretics: of those who are subject to the jurisdiction of the Inquisition, and of such crimes as are beyond its cognizance: the *third* part describes the manner of carrying on the processes before the tribunals of the holy office. It was first printed in the year 1503, at Barcelona, and afterwards at Rome in 1578, with the corrections and commentaries of Francis de Penna, since which time it has gone through several editions. Limborch made much use of it in writing his "History of the Inquisition," and it justifies that author in the darkest shades which he has given of that horrid tribunal, which, fortunately for mankind, is now for ever abolished from the face of the earth.

NICHOLAS, in *Geography*, a county of Kentucky, containing 2863 inhabitants.

NICHOLAS, *Cape St.*, the N.W. extremity of the island of St. Domingo, in the West Indies, W. of the town of its name, more commonly called "The Mole."

NICHOLAS, *Port St.*, lies on the coast of Peru, six leagues S.S.E. of Port Cavallo.

NICHOLAS *Island*, a small island on the N. coast of the island of Cuba. N. lat. $23^{\circ} 15'$. W. long. $79^{\circ} 40'$.

NICHOLAS *Point*, a cape on the N. coast of the island of Java. S. lat. $5^{\circ} 51'$. E. long. $105^{\circ} 54'$.

NICHOLASVILLE, the county town of Nicholas county, in Kentucky; 12 miles S.E. of Lexington. It has a court-house, and a few dwelling houses.

NICHOLS, FRANK, in *Biography*, a physician and anatomist of eminence, was born in London in the year 1699, where his father was a barrister. After receiving the rudiments of his education at a private school in the country, he was sent to Westminster, and thence to Oxford, where he was admitted a commoner of Exeter college in 1714. He applied himself to the usual academical exercises with great assiduity, and choosing medicine for his profession, commenced a course of dissections, which he pursued with much diligence and perseverance, so as to render himself perfectly master of this branch of his art. Hence he was chosen reader of anatomy in the university, where he used his utmost endeavours to introduce a zeal for this neglected study, and obtained a high and well merited reputation. His residence at Oxford, however, was only temporary; for at the close of his course he returned to London, where he had determined to settle, after having made a short trial of practice in Cornwall, and a subsequent visit to the principal schools of France and Italy. On his return to England, he resumed his anatomical and physiological lectures in London, and they were frequented, not only by students from both the universities, but by many surgeons, apothecaries, and others. His reputation rapidly extended, and in the year 1728 he was elected a fellow of the Royal Society, to which he communicated several papers, which were published in the Philosophical Transactions, especially some observations on the nature of aneurisms, in which he controverted the opinion of Dr. Freind; and a description of a singular disease, in which the pulmonary vein was coughed up. In the year 1729, he received the degree of M.D. at Oxford, and became a fellow of the College of Physicians in 1732. In 1734 he was appointed to read the Gualstonian lectures at the college, and chose the structure of the heart and the circulation of the blood for his subjects. At the request of the president, Dr. Nichols again read the Gualstonian lectures in 1736, choosing for his topics the urinary organs, and the nature and treatment of calculous diseases; and in 1739, he delivered the anniversary Harveian oration. In 1743, he married one of the daughters of the celebrated Dr. Mead.

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Dr. Nichols was appointed lecturer on surgery to the College in 1748, and began his course with a learned and elegant dissertation on the "Anima Medica," which was published as a separate work in 1750. While he was proceeding with his course, however, he received what he considered an insult from the College, who chose a junior fellow as an elect, on the death of Dr. Connigham, in preference to him, without any apparent reason; and he indignantly resigned his lectureship, never afterwards attending the meetings of the fellows, except when matters of the utmost importance were in agitation. In 1751 he took some revenge in an anonymous pamphlet, entitled "The Petition of the unborn Babies to the Censors of the Royal College of Physicians in London," in which Dr. Nesbitt, Dr. Maule, Dr. Barrowby principally, and sir William Browne, sir Edward Hulse, and the Scots, were the objects of his satire.

On the death of sir Hans Sloane, in 1753, Dr. Nichols was appointed his successor as one of the king's physicians; an office which he held till the death of his majesty in 1760. An offer of a pension was made to him, if he would have asked for it, but he rejected it with disdain. In 1772 he published a second edition of his treatise "De Anima Medica," to which was subjoined a dissertation "De Motu Cordis et Sanguinis in Homine nato et non nato," inscribed to his learned friend and coadjutor the late Dr. Lawrence.

Wearily at length with his profession, and with a residence in London, and also wishing to superintend the education of his son at Oxford, he removed to that city, where he had spent some of the most agreeable years of his youth. But when the study of the law recalled his son to London, the doctor took a house at Epsom, where he passed the remainder of his life in a literary retirement, varying his recreations by an attention to the recent botanical researches of Linnæus, and by some agricultural inquiries. His constitution had never been robust; he was constantly subject to severe catarrhal affections, and an asthmatic cough, which, returning with great violence in January 1778, deprived the world of this valuable man, in the eightieth year of his age. Gent. Mag. for 1778. Hutchinson, Biograph. Med.

NICHOMACHUS, one of the seven Greek writers on music that have been preserved, and collected and published by Meibomius, who supposes him to have flourished in the time of Augustus. He is the only Greek theorist of the Pythagorean sect whose writings are come down to us. He was closely followed by Boethius, as may be seen in his fifth chapter De Musica. The treatise of Nichomachus is called a Manual, and divided into two books. In the first he treats of the elements of harmony (by which the ancients meant melody, or musical intervals fit for song or melody); of the two kinds of human voice, that of speech, and that of song; of the music of the spheres, or harmonical proportions in the distances, magnitude, and motion of the heavenly bodies; of the expression of sounds by the ratio of numbers; of the seven strings of the ancient lyre, to which Pythagoras added an eighth, or the octave; how the ratio of arithmetical sounds was invented; of the diapason, or octave, in the diatonic genus; of the division of the scale by Timæus Philolaus; of the bisdiapason, or double octave in the diatonic genus; and of the progression and division of sounds in the three genera. The second book contains a sketch of the history of musical inventions, of the lyre by Mercury, of Orpheus, Linus, and Terpander, &c. names and ratios of musical sounds in the three genera.

NICHOUAN, in *Geography*, a town of Persia, in the province of Irak; 20 miles E.N.E. of Confar.

NICIAS, in *Biography*, an Athenian of considerable
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note, was the son of Niceratus, and inherited very large property, of which a great part consisted in the silver mines at Laurium. By the influence of his wealth he attained to consequence in the state, even during the life of Pericles; and after the death of that great man, he became one of the heads of the Athenian government. In the Peloponnesian war he had the command against the Lacedæmonians at Sphacteria; and being upbraided by Cleon for want of success, he proposed to that demagogue to take his place. He consented, and though he was wholly ignorant of military affairs, he made up in zeal and energy what he was deficient in with regard to experience, and completely effected the purpose which he had proposed. In 423 B.C. Nicias commanded in an expedition for the reduction of the island Cythera, in which he was successful, but though he gained much reputation by the transactions in which he engaged, yet he was perpetually endeavouring to restore peace, which, after the death of Cleon and Brasidas in battle, he performed, and a treaty, for a term of fifty years, between the Athenians and Lacedæmonians, with a league offensive and defensive, was signed B.C. 421. Alcibiades was now rising into public estimation, and seemingly bent upon embroiling the affairs of Greece, in order to give himself scope for action. General tranquillity had not been restored by the peace of Nicias; a renewal of the Peloponnesian war followed, and the people of Athens determined to send a powerful force into Sicily, in order to assist the Egæstines in their war with the Syracusans. Nicias, notwithstanding his opposition to this rash measure, was appointed one of the generals, in conjunction with Alcibiades and Larnachus; and the expedition set sail in the year 415 B.C. The Athenian troops landed in Sicily, and possessed themselves of several towns, and Alcibiades being recalled, Nicias and Larnachus took a strong post in the neighbourhood of Syracuse. The siege of that city commenced in the next campaign, and Nicias, after some successful actions, drew a line of circumvallation quite round it. The prospect of success, which, for a moment, seemed to open upon him, was clouded by the arrival of fresh supplies, and large reinforcements from Corinth. Larnachus being slain, two new generals, Eurymedon and Demosthenes, were appointed, and the former was sent from Athens with a supply of money, and an assurance to Nicias of a speedy succour. (See SYRACUSE.) Nicias constantly recommended cautious measures, and when Demosthenes, who arrived with a large reinforcement, proposed an immediate assault upon the city, he argued strongly against such a hazard. He was, however, out-voted in the council of war, and the attempt was made, which was defeated, to the great loss of the Athenians. Demosthenes was so much disheartened by the result, that he advised instantly raising the siege, and returning to Athens. But Nicias declared, that he would rather die before the place than abandon an enterprise which might still succeed, and expose himself to an ignominious condemnation from his countrymen. The aspect of affairs soon became still more gloomy; the Syracusans received powerful succours, and, what was much more alarming, a pestilential disease broke out in the Athenian camp, which daily thinned their numbers. Nicias now thought seriously of retreating, and every thing was prepared for embarkation. As the Syracusans had no suspicions of this design, it might have been easily effected, when, just at the moment, an eclipse of the moon took place. The superstition of Nicias was alarmed, and he refused to go on board the vessel till he had consulted the soothsayers. These, willing to appear wise, directed that the departure should be delayed thrice nine days, and thus the only opportunity of escape was lost. The enemy attacked the Athenians by sea and land;

destroyed a number of their ships, and the residue were closely blocked up there; and nothing was left them but to make the best retreat they were able to some friendly Sicilian state. "By false intelligence," says the historian, "Nicias was prevented from commencing his march when it might have been safe; and when want of provisions at length compelled him to leave his camp, the passes were already blocked up. There could not be a scene of deeper distress than at the moment when the army commenced its march, abandoning, not only all its baggage, but the sick and wounded, who clung round their comrades, and appealed to the gods and men against the cruelty of leaving them to a merciless foe. Nicias himself was the most melancholy figure in the group; worn down by disease and anxiety, pale and squalid, he seemed to centre in himself the afflictions of the whole. His mind, however, was entire, he bore up against despondency, and he exerted every effort to inspire courage in his men, and to make them preserve that order which alone could ensure to them safety. As they proceeded, they were continually harassed by the cavalry and light troops of the enemy, and exposed to the want of every necessary. Many were cut off, and at length Demosthenes with the whole rear-guard was forced to surrender. Nicias with the van arrived exhausted at the river Asinarus, and while they were crossing it, and quenching their extreme thirst, the Syracusan cavalry riding among them made great slaughter, without meeting with the slightest resistance." The greater part was killed, Nicias and a small body surrendered, upon condition that the slaughter should cease. The Syracusans, after a day of triumph, assembled to determine the fate of their captives, and they resolved to put the generals, at least, to death. Nicias and Demosthenes, being informed of the determination, prevented it by a voluntary termination of their lives. This terrible disaster happened in the year 413 B.C. Nicias appears to have been a man of virtue, and a sincere lover of his country; he was religious to the borders of superstition, and perpetually consulted diviners on his own affairs, and those of the state. His manners were mild, and his principles were humane and pacific. Univer. Hist.

NICKAJACK, in *Geography*, an Indian town on the S.E. side of Tennessee river, at the point of a large bend, about 36 miles N.E. of the Creeks' crossing places.

NICKEL, in *Chemistry*, a simple substance, and a metal of a white colour. When obtained perfectly pure it is malleable. Its lustre is agreeable, and at some period it may become of importance in the arts, and in domestic economy.

Assay and Analysis of Nickel.—This metal is generally obtained from a mineral of a reddish-brown colour, frequently spotted with green, found plentifully in different parts of Germany. This ore was formerly thought to be copper ore, from its green spots, but in consequence of its affording no copper, it obtained the name of *kupfer nickel*, which means false copper. This mineral chiefly consists of nickel and sulphur, but contains more or less of arsenic, cobalt, and iron. The first experiments to ascertain the nature of this mineral were by Cronstedt in 1751, who was of opinion that he had obtained a peculiar metal from it, to which he gave the name of nickel. What he procured, however, was not pure nickel, in consequence of which the authority of this chemist was doubted by Sage and Monnet. This point was at last finally settled by Bergman, who proved it to be a new metal. The experiments were published in 1775. The purification of this metal has been since carried to a greater extent by different chemists. The following is the most approved process for obtaining the oxyd of this metal in a state of purity, from which the metal is afterwards easily obtained.

After the ore above-mentioned has been roasted with charcoal, which may probably expel some of the arsenic, it must be reduced to a fine powder, and treated with nitric acid. The remaining sulphur will be separated, or, with the arsenic, converted into sulphuric and arsenic acids. If to a solution nitrat of lead be added, these acids will be precipitated by the lead in the state of sulphat and arseniat of lead. If too much nitrat of lead be added, the lead may be precipitated by adding small portions of sulphuric or rather sulphat of soda, till no more precipitates take place. The solution now contains nickel, iron, and perhaps cobalt and copper. The copper may be separated by a clean bar of iron. The solution must now be treated with carbonat of potash, by which the three oxyds will be precipitated together. These being washed, the nickel and cobalt may be dissolved in pure ammonia, while the oxyd of iron will be left behind. This ammoniacal solution is next heated, till the ammonia is driven off, which is known by its ceasing to tinge turmeric paper brown. If to these oxyds pure potash be added, the oxyd of cobalt will be dissolved, while that of nickel will be left in a state of purity. The oxyd of nickel is now to be made into a paste with oil or fat, and introduced into a crucible, with some black flux. The crucible should be lined with charcoal, and provided with a close cover; the whole must be heated strongly in a smith's forge for more than an hour. On cooling a button of pure nickel will be found.

This metal, as has been remarked, is of an agreeable white colour, possessing considerable hardness and lustre. Its specific gravity is about 8.3, which increases with hammering. It is said to be capable of being hammered into sheets not thinner than $\frac{1}{100}$ th of an inch. It is now generally believed to be magnetic, like iron. It does not fuse at a temperature less than 160° of Wedgewood. It possesses the valuable property of not being changed by exposure to the air, nor by immersion in water, at the common temperature. When, however, it is exposed to a tolerable heat, it becomes tarnished, and ultimately covered with oxyd. A much stronger heat sets this oxygen free, as is the case with the noble metals.

The oxyds of nickel at present known are two, namely, the grey and the black. Chemists are at present divided in opinion whether the green oxyd be the first or second oxyd. Dalton seems to be uncertain as to this point, the atom of oxygen being 7. And since the analysis of Richter gives 78 of metal to 22 of oxygen, we shall have, considering the grey oxyd the first oxyd, $\frac{x}{7} = \frac{78}{22}$, and $x = \frac{78 \times 7}{22} = 24.81$, the weight of the atom of nickel. If it be considered as the second oxyd, then $\frac{x}{14} = \frac{78}{22}$, and $x = 49.62$, the weight of the atom of nickel. These numbers are so near 25 and 50, that Dalton has given with doubt 25 or 50 for the atom of nickel. Sir Humphrey Davy thinks the grey oxyd the second oxyd, from the number he gives for nickel agreeing also with the sulphuret. We have, therefore, good ground for stating the weight of an atom of nickel at 50. From these data the first oxyd will consist of 50 to 7, or in the 100, there is 87.7 nickel, and 12.3 oxygen. The second, 50 to 14, or 100 will give 78.1 nickel, and 21.9 oxygen. The third, or black oxyd, will be 50 nickel to 21 oxygen, or in 100, there will be 70 of nickel, and 30 of oxygen.

The second oxyd is obtained by dissolving nickel in nitric acid, and precipitating the oxyd by means of potash. This precipitate is not the pure oxyd, but an hydrated oxyd, containing, according to Sir Humphrey Davy, $\frac{1}{4}$ th its weight

of water. When this hydrat is heated to ignition, the water is separated, leaving the grey oxyd. When the oxymuriatic acid gas is passed through water mixed with the latter oxyd, it becomes converted into the black oxyd.

Nickel combines with sulphur. We are indebted to Mr. E. Davy for the proportions of its combination with sulphur, which he states at 34 sulphur to 66 nickel. This sulphuret must be considered as 2 atoms of sulphur, 2×13

to 1, of nickel, 50, for $\frac{50 + 26}{26} = \frac{100}{34.2}$, or 34.2 oxygen to 65.8 nickel. This very strongly confirms the truth of the number 50 for the weight of the atom of this metal. From the same authority there appears to be another sulphuret, formed by heating the grey oxyd with sulphur, consisting of 56.5 nickel, and 43.5 oxygen. This will be 3×13 to 50, which gives 43.8 sulphur, and 56.2 nickel. Nothing can be more satisfactory than this almost exact agreement between theory and practice. The first sulphuret will be 13 to 50, or in 100, 20.6 sulphur, and 79.4 nickel. According to the authority of Thenard, phosphorus combines with nickel in the proportions of 17 phosphorus to 83 of nickel. Theory would give the first phosphuret 50 to 9, or *per cent.* 15.3 phosphorus, and 84.7 nickel. The second sulphuret will be 50 to 2×9 , or *per cent.* 73.5 nickel, and 26.5 phosphorus. The combination of nickel with hydrogen, nitrogen, carbon, and the base of the boracic acid, is not known. It forms alloys with some of the metals, but these compounds have been little examined. Since nickel is a malleable metal, and difficult of fusion, some fusible alloy with it might be of importance. Its alloy with gold was tried by Mr. Hatchett in the proportions of 11 gold to 1 of nickel, which was brittle, and of the colour of brass. Sir H. Davy speaks highly of its alloy with iron: its colour approaches silver as the nickel prevails, while the malleability of the iron is not impaired. It is also less liable to rust than iron. The same author observes that iron in meteoric stones is alloyed with nickel from 1.5 to 17 *per cent.* of the latter.

Salts of Nickel, or the Combination of its Oxyds with Acids.—The few facts of which we are in possession of combinations of this substance with acids, are not strictly to be relied upon, from the circumstance of the experiments being made upon impure nickel.

Sulphat of Nickel.—Sulphuric acid has little action upon nickel, but it dissolves its oxyd, forming a salt, the solution of which is of a beautiful green colour. By evaporation it affords prismatic crystals, which afterwards effloresce and become opaque. The composition of this salt has not been ascertained, but it may be inferred with some hope of truth, from the near coincidence of the other compounds of nickel with theory. The oxyd which unites with the acid is doubtless the grey; hence $34 + 50 + 14$ will constitute the salt, or 34 acid to 64 oxyd. This will give *per cent.* 34.7 acid, and 65.3 of base.

Nitrat of Nickel.—Nitric acid oxydates and dissolves nickel. The solution is of a green colour, and affords rhomboidal crystals. This salt is first deliquescent, and afterwards falls to powder, by losing its acid, the atom of nitric acid being 19; and since the soluble nitrats mostly contain two atoms of oxygen, it will be constituted by 2×19 acid to 64 of oxyd.

Muriat of Nickel.—The muriatic acid acts feebly upon nickel. With the aid of nitric acid, however, it becomes oxydated, and the muriatic acid dissolves it, forming a green solution, which at first crystallises in the form of rhomboidal prisms. These are soon acted upon by the air, and ultimately

mately lose the acid, like the nitrat, the atom of muriatic acid being 22. This salt will consist of 22 acid, and 64 of base.

Phosphat of Nickel.—The phosphoric acid takes up a very small quantity of the oxyd of nickel, and hence is perhaps almost an insoluble salt. Hence the best way of forming it will be by adding phosphat of soda to nitrat of nickel. It will be formed by 23 of acid, and 64 base.

Fluat of Nickel.—This salt is soluble, and affords green crystals. It will consist of 15 acid, and 64 base.

Borat of Nickel.—This salt is very little known. It may be formed by mixing borat of soda with nitrat of nickel.

Carbonat of Nickel.—This salt is mentioned by Bergman, who formed it by adding an alkaline carbonat to the nitrat of nickel. He found it to consist of 56.4 acid and water, and 43.6 of base.

Acetat of Nickel.—Oxyd of nickel dissolves in acetic acid, forming a soluble salt, which crystallises in a rhomboidal form, and of a green colour.

Oxalat of Nickel.—The oxalic acid slightly attacks nickel, with which it forms a green powder, from the salt being insoluble. It should be formed by adding oxalat of soda to a nitrat of nickel. The salt falls down in the form of green powder.

Tartrat of Nickel has not been examined.

Arseniat of Nickel.—This is a soluble salt, but little known.

Molybdat of Nickel.—This salt is in the form of white powder, and probably insoluble.

Sulphat of Nickel and Potash.—This is a triple salt, discovered by Proult. It is formed by adding potash to the sulphat of nickel. By evaporation it easily crystallises in the form of prisms of a beautiful green colour. It has a sweetish taste.

Sulphat of Nickel and Ammonia.—Using ammonia as the potash is used in the last salt, forms a triple salt of a green colour, affording flat prismatic crystals.

Sulphat of Nickel and Iron.—This salt is formed by adding nitrat of nickel to sulphat of iron, or by dissolving the two oxyds in sulphuric acid. It affords green crystals, which are efflorescent.

A triple salt is also formed by adding an excess of ammonia to nitrat of nickel, consisting of nitric acid united with oxyd of nickel and ammonia. It affords green coloured crystals. This salt has the peculiar property of being decomposed by the alkalies, at least the oxyd is not precipitated. This property is of some importance for separating nickel from other metals. The metal is, however, precipitated by the hydro-sulphurets. For the principles on which the numbers representing the relative weights of the atoms of bodies are calculated, see *PROPORTION of Chemical Compounds*.

NICKELHAJEN, in *Geography*, a town of Prussia, in the province of Oberland; 9 miles S.E. of Salsfeldt.

NICKELSDORF, a town of Prussia, in the palatinate of Culm; 12 miles N. of Straßburg.

NICKELSTADT, a town of Silesia, in the principality of Liegnitz; 5 miles S.S.E. of Liegnitz.

NICKER TREE, in *Botany*. See *GUILANDINA*.

NICKIOBING, in *Geography*, a town of North Jutland, situated on the E. coast of the island of Mors, with a good harbour in the Lymford gulf; 38 miles W.N.W. of Wiborg. N. lat. 56° 54'. E. long. 8° 52'.

NICLOWITA, a town of Moravia, in the circle of Znaym; 10 miles N. of Znaym.

NICOBARS, or NANCEVERIS, a group of three islands in the Eastern sea, situated between 8° and 9° N. lat. to the northernmost point of the island of Sumatra. The position of three of these islands forms one of the safest harbours in

India, where ships of all sizes may ride with the greatest security, sheltered from all winds, about half a mile from shore; with the additional advantage of two entrances, that may serve for getting in and out, both with a N.E. and S.W. monsoon, having a clear deep channel on each side. The largest of these islands, called Nancaveri or Nancoury, is about five or six leagues in circumference, and better inhabited than either of the other two. The second is called Sowry or Chowry, and the other Tricút, all closely situated, and about 10 leagues to the N.E. of them is another called Catchoul. Almost the whole of these islands is uncultivated; though there are many large valleys that might be rendered very fruitful, with little trouble, the soil being naturally fertile, where the cocoa-nut and all other tropical fruits come spontaneously to the highest perfection, together with yams and sweet potatoes, for obtaining which it is only necessary to scratch the earth superficially, and the seeds so planted come forth in a few days. Tricút, which is the flattest of these islands, is divided among the inhabitants of the other two, where they have their plantations of cocoa-nut and areca trees; these last being very abundant all over the islands. The surrounding sea abounds with exquisite fish, shell-fish, as cockles and turtles; and a most splendid display of beautiful shells of the rarest sort is to be met with on the shore. The birds' nests, so much esteemed in China, are to be found among the rocks; ambergris is found here, and the inhabitants have acquired the art of adulterating it; but the method of discovering whether it be adulterated with any heterogeneous substance, such as wax or resin, is to place a small bit of it upon the point of a hot knife; and if it evaporates, without leaving any calx, and diffuses a strong fragrant smell, it is certainly genuine.

The inhabitants of these islands are of a copper colour, with small oblique eyes, with small flat noses, large mouths, thick lips, and black teeth; well proportioned in their bodies, rather short than tall, with large ears, in the lobes of which are large holes: they have black strong hair, which they cut round; the men have little or no beard; the hinder part of their head is much flatter than ours; they never cut their nails, but they shave their eyebrows. A long narrow cloth, made of the bark of a tree, round their waist and between their thighs, with one extremity hanging behind, which has led some ignorant persons to report that they had tails, and to mislead even Linnæus, is their only dress. The women resemble the men in colour and dress, but are of smaller stature. Both sexes are very fond of dress, whenever they can obtain it. They live in huts made of cocoa-nut leaves supported on bamboos, about five or six feet high from the ground; they enter these by a ladder, and the floor is made partly of planks and partly of split bamboos. Six or eight people generally occupy one hut, and skulls of wild boars form the most valuable articles of furniture. The occupation of the men consists in building and repairing their huts, and also in fishing and trading to the neighbouring islands. The women are employed in preparing the victuals and cultivating the ground; they also paddle in the canoes, when the men go out. They unite in matrimony through choice; but if the man is dissatisfied with his wife, from any cause whatsoever, he may discharge her, and then each may unite with another person. Adultery is accounted highly ignominious; and in some cases punishable not only with a disgraceful dismissal, but even with death: although by the intervention of a small token given publicly, and consisting of nothing more than a leaf of tobacco. The reciprocal leading of their wives of the same cast is very common. A woman that has three children is reckoned very fruitful; few bear more than four. Few persons in these

these islands, particularly among the males, live to be more than 40 or 48 years. Their indolency is not equalled by any other people of the east. Of those who can read and write they have the highest opinion; the Europeans, possessing these qualifications, can perform acts more than human; and they conceive, that the power of divination, of controuling the winds and storms, and of directing the appearance of the planets, is at our command. The dead are buried close by their huts, in their best dress and with plenty of food, and with much previous lamentation on the part of survivors. The different changes of the moon are productive of great festivity among the Nicobarians. In chronological computations, they reckon only by moons, of which they number 14, seven to each monsoon. At the fair season, or beginning of the N.E. monsoon, they sail in large canoes to the "Car Nicobars," called by them "Champaloon." The object of this voyage is trade; and for cloth, silver coin, iron, tobacco, and some other articles, which they obtain from Europeans, together with fowls, hogs, cocoa and areca nuts, the produce of their own island, they receive in exchange canoes, spears, ambergris, birds' nests, tortoise shells, &c. Ten or twelve huts form a village. The number of inhabitants on any one of these islands does not exceed 7 or 800. Every village has its "head-man," or captain, who is generally the oldest. The only quadrupeds on these islands are hogs and dogs. Among the feathered tribe pigeons are abundant from June to September, on account of a berry which is then ripe, and of which they are very fond; pheasants and turtle doves are also then found; but the constant inhabitants of the woods are a species of the green parrot, or parroquet, with a black tail and collar. The climate might, with little trouble in cultivation and clearing the woods, be rendered very salubrious. The whole of their music consists of few notes: their dance is dull and inanimate; the basis of their language is the Malay, but they have no expression for any number beyond 40. They have trees in their woods of great height and size, and of a compact texture, which might serve for naval purposes; but the cocoa and areca nut trees are those which they most value. The former serve for their own nourishment and that of their hogs, and is also an object of trade. The ships that are bound to Pegu from either of the coasts of India touch at the Nicobar islands, and purchase a cargo of cocoa-nuts at the rate of four for a tobacco leaf, and 100 for a yard of blue cloth, and a bottle of cocoa-nut oil for four leaves of tobacco. The tropical fruits grown in these islands are exquisitely flavoured, and particularly the pine-apple: the wild cinnamon and saffras grow here. The tree called by the natives "Larum," and by the Portuguese "Mellori," is very abundant, and produces an excellent bread-fruit, different from the kind found in the interior parts of Africa, and also from that of Otaheite. This tree is a species of the *Pandanus* of botanists. Asiatic Res. vol. iii.

NICOCOR, a town of Africa, in the kingdom of Cayor, near the sea; 40 miles N.W. of Amboul.

NICOL, in *Natural History*, a word used by the miners in Germany to express a greenish crust, covering several of the species of marcasites and cobalt; it emits fumes that smell of garlic in the calcination, and is very injurious to the workmen, causing contractions of their limbs, and other disorders. It is sometimes found in masses alone, but that more rarely.

NICOLAI CATHOLICON. See CATHOLICON.

NICOLAITANS, or NICOLAITES, in *Ecclesiastical History*, one of the most ancient sects in the Christian church; thus denominated from Nicolas, a person ordained a deacon of the church of Jerusalem, together with St. Stephen.

The distinguishing tenet of the Nicolaitans, as represented by ecclesiastical historians, is, that all married women should be common; to take away all occasion of jealousy.

Other authors tax Nicolas with other impurities; but Clemens Alexandrinus imputes them all to his disciples, who, he says, abused their master's words.

In the charge urged against the Nicolaitans (Rev. ii. 6, 14, 15.) they are not reproached with erroneous opinions concerning the Deity, but with the licentiousness of their practice, and the contempt of that solemn law, which the apostles had enacted, (Acts, xv. 29.) against fornication, and the use of meats offered to idols. It is, however, certain, that the writers of the second and the following centuries, Irenæus, Tertullian, Clemens, and others, affirm, that the Nicolaitans adopted the sentiments of the Gnostics, concerning the two principles of all things, the æons, and the origin of this terrestrial globe. The authority of these writers, says Mosheim, would be entirely satisfactory in this matter, were there not some reason to imagine, that they confounded, in their narrations, two sects very different from each other, viz. that of the Nicolaitans, mentioned in the Revelations; and another, founded by a person named Nicolaus, in the second century, upon the principles of the Gnostics.

Cocceius, Hoffman, Vitringa, and Maius, take the name Nicolai an to be coined, to signify a man addicted to pleasure and debauchery; adding, that it has nothing to do with Nicolas, one of the seven deacons. This Nicolas was condemned by Hippolytus and Epiphanius; whilst Ignatius, Clement, Eusebius, and Theodoret, though they condemned the heresy of the Nicolaitans, say that Nicolas was not such an one. Hippolytus, in his book against heresies, includes that of the Nicolaitans.

NICOLAS, *Argonauts of St.* See ARGONAUTS.

NICOLAS, in *Geography*, a small island near the N. coast of Cuba. N. lat. 23° 15'. W. long. 79° 40'.

NICOLAU, or NIKOLOWICE, a town of Silesia, in the principality of Ratibor; 27 miles E. of Ratibor.

NICOLAUS, DAMASCENUS, in *Biography*, a philosopher and historian, was in great esteem in the age of Augustus, by whom, as well as by king Herod, he was admitted to intimate friendship. He was born at Damascus, of the Peripatetic sect, and was very extensively learned. Many of his writings are referred to by Suidas and others, of which only some fragments are come down to our times. A History of Assyria, of his composition, is quoted, which is said to have been part of an Universal History, in many books, referred to by Josephus, Suidas, and Athenæus. Some passages of this are cited by Josephus, who impeaches the author's veracity with respect to the account of Herod, written during the life of that prince. Strabo quotes from him certain matters relative to India. Henry de Valois published at Paris, in 1634, in Greek and Latin, the collections from different works of this author made by Constantine Porphyrogenitus, and brought from the isle of Cyprus by Peiresc. Moreri.

NICOLAYKEN, or ST. NICHOLAS, in *Geography*, a town of Prussia, in the province of Natangen; 68 miles S.S.E. of Königsberg. N. lat. 53° 38'. E. long. 21° 43'.

NICOLE, FRANCIS, in *Biography*, a very celebrated French mathematician, who flourished in the eighteenth century, was born at Paris in the year 1683. He early discovered a strong attachment to mathematical studies, and being blessed with an able instructor, he made a most successful progress, and became intimately conversant with the higher branches of geometry. He was first brought into notice by detecting the fallacy of a pretended quadrature of the circle.

circle. The author of this quadrature was so confident in the merit of his supposed discovery, that he deposited 3000 livres in the hands of a public notary at Lyons, to be paid to any person who, in the judgment of the Academy of Sciences, should demonstrate his solution to be erroneous. Nicole undertook the task, and so effectually exposed the author's errors, that the Academy awarded him the prize, without the smallest hesitation. The premium thus obtained he presented to the Hôtel-Dieu of Lyons. In the year 1707, the Academy nominated him mechanician; in 1716, adjunct; in 1718, associate; and in 1724, pensioner. He retained his pension till his death in 1758, when he was about seventy-five years of age. Though a profound geometriician, he mixed with the best company, and was himself a lively and amiable companion. His works are numerous, and inserted in the different volumes of the "Memoirs of the Academy of Sciences." They are all mathematical, and chiefly in the higher departments of learning: a list of them is given in the General Biography.

NICOLETE, in *Geography*, a town of Canada, on the S.E. bank of lake St. Pierre, at the mouth of the river Nicolette, which runs into this lake, N. lat. 46° 12'. W. long. 72° 30'.

NICOLINO GRIMALDI, *il Cavaliere*, in *Biography*, commonly known by the name of Nicolini. This great singer, and still greater actor, arrived in England in the year 1708, which forms an era in the annals of our Lyric theatre; as he was the first vocal performer of the highest class from Italy that trod our stage, and gave us a taste at once of fine singing and fine acting. He was a native of Naples; his voice was at first a *soprano*, but afterwards descended into a full and rich *contralto*. The first operas in which we have met with his name in Italy were "Tullo Otilio" and "Xerxes," two dramas composed by John Bononcini for Rome, in 1694, in which he performed with the celebrated Pistocchi, the founder of the Bologna school of singing. So that Quadrio has ranked him very properly among the great opera singers who began to appear between 1690 and 1700. In 1697 and 1698 we find him the principal singer in the Neapolitan operas; and in 1699 and 1700 again at Rome. From this period till his arrival in England, whither he was drawn, as Cibber informs us, chap. xi. p. 315, by the report of our passion for foreign operas, "without any particular invitation or engagement," he sung at Venice, Milan, and other cities of Italy where the musical drama was established. Before his abilities as a singer are considered, let us remind the reader of sir Richard Steele's eulogy upon him, in the Tatler, N° 115, as an actor; where, after calling the opera (it was "Pyrrhus and Demetrius") "a noble entertainment," he adds, "for my own part I was fully satisfied with the sight of an actor, who, by the grace and propriety of his action and gesture, does honour to the human figure. Every one will imagine I mean signior Nicolini, who sets off the character he bears in an opera by his action, as much as he does the words of it by his voice. Every limb and every finger contributes to the part he acts, inasmuch that a deaf man may go along with him in the sense of it. There is scarce a beautiful posture in an old statue which he does not plant himself in, as the different circumstances of the story give occasion for it. He performs the most ordinary action in a manner suitable to the greatness of his character, and shews the prince even in the giving of a letter, or dispatching of a messenger. Our best actors," continues he, "are somewhat at a loss to support themselves with proper gesture, as they move from any considerable distance to the front of the stage; but I have seen the person, of whom I am now speaking enter alone, at the remotest part of it, and

advance from it with such greatness of air and mien, as seemed to fill the stage, and at the same time commanded the attention of the audience with the majesty of his appearance."

The opera prices were raised on the arrival of this performer, the first truly great singer who had ever sung in our theatre, to 15s. for the boxes on the stage, half a guinea the pit and other boxes, and first gallery five shillings. Nicolini was a phenomenon that occupied the attention at this time of the whole nation; not only sir Richard Steele has celebrated the majesty of his appearance on the stage in the Tatler; but Mr. Addison, not in very good humour with operas so soon after the failure of his "Rosamond," celebrates the abilities of Nicolini as an actor in the Spectator, N° 13, after several humorous papers on the combat with the lion in the opera of "Hydaspes," with very high and serious panegyric. "It gives me a just indignation," says he, "to see a person whose action gives new majesty to kings, resolution to heroes, and softness to lovers, thus sinking from the greatness of his behaviour, and degraded into the character of the London 'prentice. I have often wished, that our tragedians would copy after this great master in action. Could they make the same use of their arms and legs, and inform their faces with as significant looks and passions, how glorious would an English tragedy appear with that action, which is capable of giving a dignity to the forced thoughts, cold conceits, and unnatural expressions of an Italian opera." In 1712, when Nicolini appeared in the opera of "Antiochus" for the last time before his departure for Italy, as was imagined for ever, Mr. Addison, in the Spectator for June 14th, N° 405, says, "I am sorry to find, by the opera bills for this day, that we are likely to lose the greatest performer in dramatic music that is now living, or that perhaps ever appeared upon a stage. I need not acquaint my readers that I am speaking of signior Nicolini. The town is highly obliged to that excellent artist, for having shewn us the Italian music in its perfection, as well as for that generous approbation he lately gave to an opera of our own country, in which the composer endeavoured to do justice to the beauty of the words, by following that noble example, which has been set him by the greatest foreign masters in that art." This is all allusive to the opera of "Calypso," with the fifth performance of which the season was closed, June 25th. Nicolini, however, returned to England, and in the year 1715 we find him performing in Handel's opera of "Rinaldo," and receiving his accustomed applause. And, according to the ideas which tradition gives us of the abilities of this performer, his part in "Rinaldo" must have drawn out all his powers both as a singer and actor. He continued here till the year 1717, when he returned to Italy for the last time; but continued in favour there as an actor, after his vocal powers were faded, and a new style of singing was established; for in 1723 we still find him at Rome with the Tefi, in Leo's "Timocrate."

NICOLO DEL ABATE, born at Modena in 1512, was the disciple of Antonio Begarelli, a Modenese sculptor, whose models Corregio is said to have often made use of in his works. Little is known of his progress at Modena, except that in partnership with his fellow scholar Alberto Fontana, he painted the pannels of the butcher's hall in that place; and at the age of thirty-five, for the church of the Benedictines, the celebrated picture of the Martyrdom of St. Peter and St. Paul, now in the gallery at Dresden, with some fresco paintings drawn from Ariosto and Virgil, in the palace of Scandiano. Of his works at Bologna, tradition has left a very distinguished account, though little or nothing exists of them now but the large symbolic picture in the
Via

Via di St. Mamolo, which Maivafia calls a hieroglyphic; a nativity of Christ, under the portico of the Leoni palace: and four conversation pieces and concertos, of exquisite taste and urbanity, in the frieze of an upper apartment in the Academical Institute, which have been engraved.

Notwithstanding the innate vigour, the genial facility, and independent style of Nicolo Abate, he owes the perpetuity of his name, in a great measure, to his technic coalition with Francesco Primaticcio, and to the facility with which he executed the comprehensive and luxuriant plans of that classic machinist: even his own name was sunk in the title of that patron rather than partner of his labours, and he is called Nicolo del Abate, because Primaticcio was abbot of St. Martin, near Troyes. He went to France at his call in 1552, and his was the principal hand which executed in frescos of unparalleled vigour and glow the extensive fides and ciellings of the galleries and apartments at Fontainebleau, from the designs of Primaticcio. The subjects were epic and mythologic: in the great gallery, the adventures of Ulysses, in 58 compartments, below; and the gods of Homer, in 15 of various dimensions, above.

This magnificent work, to the eternal disgrace of the barbarian of an architect who gave, and the Goth of a minister who listened to the advice, was dilapidated and levelled with the ground in Dec. 1738, to make room for a new fabric; and nothing remains but a few pictures of the history of Alexander, in the apartment of madame d'Estampes, which was left standing. The adventures of Ulysses have been etched by Theodore van Fuldén; and some of the lunettes and larger compositions of the gallery have been engraved by G. Mantuano, Anthony Garnier, and Stephen de Laune. Fuseli's Pilkington.

NICOLO, Germ., in *Musik*, a wind instrument, blown with a reed, and used as a tenor to the bassoon, of which the hautbois is the treble. Walther.

NICOLOSIO, JOHN-BAPTIST, in *Biography*, a Sicilian geographer of some eminence, who died at Rome in the year 1670. He was well grounded in those departments of knowledge upon which the true principles of geography rest, and by his superior talents recommended himself to the notice of pope Alexander VII. His principal works are "Hercules Siculus, sive Studium Geographicum," in two volumes; "Guida allo Studio Geographico;" "La Theorica del Globo Terrestre;" "Orbis Descriptio," in ten large maps; "A Description of the Dominions of the Church;" "A Description of the Kingdom of Naples;" "Maps and Charts, with Notes illustrative of the History of Alexander, by Quintus Curtius," and other works.

NICOLSBURG, in *Geography*, a town of Moravia, in the circle of Brunn; 22 miles S. of Brunn. N. lat 48° 52'. E. long. 16° 33'.

NICOLSON, WILLIAM, in *Biography*, an English prelate, distinguished for his knowledge of the history and antiquities of his country, was born about 1655, at Orton, in Cumberland, in which county his father was parish rector. He studied at Queen's college, Oxford, and soon after quitting the university, was sent by sir Joseph Williamson, secretary of state, to travel on the continent. From his observations in this tour, he was enabled to draw up a copious description of Poland, Denmark, and Germany, which was printed in Pitt's Atlas, in 1680-1. On his return from his travels, he took his degree of M.A., became fellow of his college, and was made chaplain to the bishop of Carlisle, who gave him a prebend, and an archdeaconry, with a vicarage in his diocese. In 1696 he published the first part of his "English Historical Library," a work to which we have often referred, and which was intended to give

a brief view and character of most of our national historians, whose writings are extant either in print or MS. It was followed by a second part in 1697, and a third in 1699; and all the parts were published together, in a more enlarged and correct state, in 1714. Previously to this last date, he published "A Scottish Historical Library," of the same kind; and in that year he was promoted to the bishopric of Carlisle. His "English Library" drew down upon him an attack from Atterbury, in his work on the "Rights, Powers, and Privileges of an English Convocation." Dr. Nicolson replied to it in a letter to Dr. White Kennet. In 1717 he was engaged in a dispute respecting something he was reported to have said in relation to the celebrated sermon of Dr. Hoadley, then bishop of Bangor, which occasioned the Bangorian controversy; and in the course of the discussion, bishop Nicolson and Dr. White Kennet publicly and positively contradicted one another, as to an occurrence between them. This circumstance is thought to have occasioned the bishop's removal to Ireland, being in 1718 translated to the see of Londonderry. His enquiries in that country gave rise to his "Irish Historical Library," printed at Dublin in 1724. He shewed his attention to the interests of his see, by erecting a building in the palace-garden for the preservation of the records and other manuscripts relating to it. In January 1726-7, he was translated to the archbishopric of Cashell; but before he could take possession of it, he died at Londonderry, in the February following. He was unquestionably a man of great learning, to whom the world is much indebted, not only for his antiquarian researches, but for his knowledge in the sciences in general. A list of his publications, independently of his "Libraries" already noticed, is given in the Biog. Britannica.

NICOMEDES, an ancient geometrician, celebrated for having been the inventor of the curve named the conchoid, which has been made to serve equally for the resolution of the two problems relating to the duplication of the cube, and the trisection of an angle. It was much used by the ancients, in the construction of solid problems. Sir Isaac Newton approved it for trisection angles, or finding two mean proportionals, and for constructing some other solid problems, as may be seen in his "Arithmetica Universalis." It is not certain at what period Nicomedes flourished, but it was probably at no great distance from the time of Eratosthenes, as he holds him up to ridicule on account of the mechanism of his *Mesolabe*, (which see,) and also from the circumstance that Geminus, who lived in the second century B.C. wrote on conchoids, of which Nicomedes was then allowed to be the inventor. See CONCHOID.

NICOMEDES, or MESOMEDES, a famous musician, who flourished about the year 145 of the Christian era, under the reign of Antoninus. He was the first who drew up a body of rules for performing on the lyre. The emperor, however, retrenched his salary as a musician of the court, telling him that it would be shameful, and even cruel, if those whose labours were of no use to the state should partake of his benefits. Other sovereigns, in other times, have regarded the art of music as very useful to humanity. Laborde.

NICOMEDIA, in *Ancient Geography*, a town of Asia Minor, in Bithynia, on the Astacene gulf. It had once borne the appellation of Olbia, a pretended nymph who had laid its foundation. Nicomedes, king of Bithynia, afterwards enlarged and embellished it, and gave it his own name. Pausanias says that it was one of the most considerable towns of Bithynia. Hannibal made it a place of refuge, when he could find no other asylum from the fury of the Romans.

NICO.

NICOMIA, in *Natural History*. See CHERT.

NICON, in *Biography*, a distinguished Russian prelate, was born in 1613, of obscure parents, in a village belonging to the government of Nishnei Novgorod. He received at the baptismal font the name of Nikita, which afterwards, when he became a monk, he changed to Nikon, the appellation by which he is more generally known. He was educated in the convent of St. Macarius, where his studies were directed almost entirely to the holy scriptures, and influenced by the exhortations of his preceptors, he imbibed at a very early period the strongest attachment to a monastic life, but his father set his face against it, and he entered into the marriage state, and thus precluded from admission into the convent, he was ordained a secular priest. With his wife he spent ten years, first as a parish-priest in a country village, and afterwards at Moscow in the same capacity; but having lost three children, whom he tenderly loved, he became disgusted with the world, and having persuaded his wife to take the veil, he entered into the monastic order. He chose for his retreat a small island in the White sea, inhabited only by a few persons, who formed a kind of ecclesiastical establishment, as remarkable for the austerity of the rules as for the solitude of the situation. There were twelve monks, each occupying a separate cell, about a mile and a half distant from one another, and from the church, which stood in the centre of the island. These lonely anchorites assembled every Saturday evening in the church, where they assisted in the performance of divine service during the whole night, and the next day till noon, and then retired to their respective habitations. After a short residence in this island, he accompanied the chief of the ecclesiastical establishment to Moscow, to raise a collection for the purpose of building a new church, but he had scarcely returned from this expedition, when, at the instigation of the principal, whom he had offended during his journey, he was driven by the other monks from the island. He embarked, during very tempestuous weather, in an open boat, with only one person, and was driven upon an island near the mouth of the river Onega. From this island he repaired to a monastery on the continent, and was admitted into the society; but instead of inhabiting an apartment in the convent, he constructed a separate cell on an adjacent island, where he lived on fish which he caught with his own hands, and never visited the monastery but during the time of divine service. On the death of the superior he was unanimously elected to fill the vacant dignity. In this capacity he continued three years, at the end of which, being induced, by family affairs, to visit Moscow, he was presented to the czar, who, captivated by his talents and learning, detained him at Moscow, under his immediate protection. He soon obtained church preferment, was made abbot, archbishop, and at length patriarch of Russia, promotions which he deserved by his extraordinary virtues, rare talents, and sound learning. While archbishop of Novgorod, he had an opportunity of displaying a memorable instance of firmness and discretion. During a popular tumult, the imperial governor took refuge in the archiepiscopal palace against the fury of the insurgents, who bursting open the gates, insisted, with threats of speedy vengeance, that the governor should be instantly delivered up to them. Nikon, instead of complying with their demand, advanced boldly into the midst of them, and exhorted them to peace. They seized the worthy prelate, treated him with every indignity, and left him for dead. Obtaining speedy medical aid, he recovered, and did not cease his efforts till he had carried his point, and such was the prudence which he manifested, that he actually softened the hearts of those who but a short time before had exulted in his supposed destruction; and many of the deluded

multitude flocked around him, intreating him not only to forgive them their ill conduct, but to intercede for them with their sovereign. Being armed with full powers delegated by the emperor, he finally quelled the rebellion. To him also was committed the trial of the rebels, and the absolute disposal of life and death; an office which he executed with so much judgment and lenity, that he only punished with death the leader of the sedition, ten others suffered the punishment of the knout, and were afterwards banished, and a few were condemned to a short term of imprisonment. The conduct of Nikon on this occasion was admired even by his enemies: he gained the respect of the inhabitants by the unwearied assiduity with which he performed the functions of his archiepiscopal office, and conciliated their affection by acts of unbounded charity. He built and endowed almshouses for widows, old men, and orphans, was the great patron of the indigent; the zealous protector of the lower class of men against the oppressions of the great, and during a dreadful famine, appropriated the revenues of his see to the general relief of the poor. Nikon was no less conspicuous in the vigilant discharge of his patriarchal office, to which he was appointed in 1652, being then in the thirty-ninth year of his age. He established schools for the instruction of priests in the Greek and Latin languages, and enriched the patriarchal library with rare ecclesiastical and classical manuscripts, brought from mount Athos. By the diligent revival of the holy scriptures, he perceived that many errors had crept into the printed copies of the Bible and Liturgy, and prevailed upon the czar to summon a general council of the Greek church at Moscow, in which it was determined that the most ancient Slavonian version of the bible was exact, and that the numerous errors which had crept into the later copies should be corrected. He superintended the printing of a new edition of this Slavonian bible, which was become exceedingly rare. He removed from the churches the pictures of deceased persons, to whom many of the Russians offered the most blind adoration; he abolished certain ceremonies, which had been carried to a superstitious excess; and, says Mr. Coxe, "in a word, his labours tended more to the reformation of the church, than the united efforts of all his predecessors in the patriarchal chair." Nikon was no less distinguished for his talents in a civil capacity, and being consulted by the czar on all occasions, he soon became the soul of his councils, and gained a complete ascendancy in the cabinet. The influence which, from the superiority of his genius, he thus obtained in the czar's councils, induced Voltaire, in his erroneous account of this patriarch, to assert that "he wished to raise his own chair above the throne, and that he not only usurped the right of sitting close to the czar in the senate, but pretended that neither peace nor war could be made without his consent." "This idle assertion," says Mr. Coxe, "has been adopted by the compiler of the article Russia in the Universal History," but nothing can be more void of foundation.

After having thus attained the highest summit of human grandeur to which a subject can arrive, he fell a victim to popular discontents, and to the cabals of a court. His fall was more sudden than his rise, and is traced from the following causes: the people became his enemies on account of his reformation of the ceremonies in the church; the priests and clergy, because he looked for more purity in their moral conduct, and more learning than they chose to be at the pains of acquiring; the courtiers were jealous of his pre-eminence, which was the consequence of his superior talents. All these parties united in one combination against him; and Nikon hastened his fall by his supercilious demeanour, which occasionally bordered upon arrogance; by trusting

solely

solely for his support to the rectitude of his conduct, and the favour of his sovereign, and by neglecting to guard against what he considered the petty intrigues of a court. At first he was excluded from the presence of his sovereign, and disdaining to hold the highest office in the kingdom when he had lost the confidence of his master, he voluntarily abdicated his patriarchal dignity. This was on the 21st of July, 1658, after he had held the high office only six years: he quitted that exalted station with the same greatness of soul with which he had ascended it. He was permitted to retain the title of patriarch, while the functions of his office were performed by the archbishop of Novgorod. He chose for the place of residence the convent of Jerusalem, built and endowed by himself, which is situated about the distance of thirty miles from the city of Moscow. Upon his arrival at the convent, he immediately re-assumed his former recluse way of life, and practised the most rigid mortifications. The hermitage which he inhabited is thus described by an author who visited the spot in the beginning of the last century: "a winding stair-case, so narrow, that one man could hardly pass, leads to a little chapel, of about a fathom square, in which the patriarch used to perform his solitary worship. The room in which he lived was not much larger; in it hung a broad iron plate, with a cross of brass, fixed to a heavy chain, weighing above twenty pounds, all which the said patriarch wore about his neck for twenty years together. His bed was a square stone two ells in length, and scarcely one in breadth, over which was spread nothing but a covering of rushes. Below, in the house, was a small chimney, in which the patriarch used to dress his own vicuals." Nikon did not spend his whole time in the performance of useless austerities, he employed himself in compiling a regular series of Russian annals from Nestor, the earliest historian of that country, to the reign of Alexey Michaelovitch. After comparing and collating numerous manuscripts, he digested the whole collection in chronological order, into a work, which is sometimes called, from its author, "The Chronicle of Nikon," and sometimes, from the place where it was begun and deposited, "The Chronicle of the Convent of Jerusalem." This compilation is justly esteemed as a work of great authority. The innocent manner in which the author passed his time could not protect him from the persecution of his enemies. Complaints were urged against him, and new crimes were invented to render him still more obnoxious, till at length he was deposed, and banished to a distant convent. The principal cause assigned for this deposition was, that Nikon, having by his voluntary abdication meanly deserted his flock, was unworthy to fill the patriarchal chair; and this allegation is a sufficient proof that the other crimes were maliciously imputed to him, circulated merely to prejudice the czar, and to influence the judges against him. In conformity to his sentence, Nikon was degraded to the condition of a common monk, and imprisoned in the convent of Therapont, in the government of Bielozero. His confinement, for some time, was extremely rigorous, because, conscious of his own integrity, he persisted in a denial of all guilt, and refused to compromise the matter by accepting a pardon for crimes which he had never committed. Upon the death of Alexey, in 1676, Feodor, probably at the instigation of his prime minister, prince Galitzin, the friend and patron of genius, permitted Nikon to remove to the convent of St. Cyril, in the same government, where he enjoyed the most perfect liberty. Nikon survived his deposition fifteen years. In 1681, he obtained permission to return to the convent of Jerusalem, that he might end his days in that favourite spot, but the venerable old man expired upon the road on his journey, in the sixty-

sixth year of his age. His remains were transported to that convent, and buried with all the ceremonies which are usual at the interment of patriarchs. See Coxe's Travels, vol. ii.

NICONIA, in *Ancient Geography*, a town situated on the Euxine sea, at the mouth of the Ister.—Also, a town placed by Strabo on the northern bank of the Tyras, or Dniester, about 140 stadia from its mouth. It was probably the same with the preceding town.

NICOP, in *Geography*, a town of European Turkey, in Bulgaria; 45 miles E.S.E. of Nicopoli.

NICOPOLI, a town of European Turkey, in Bulgaria, situated on the Danube, said to have been built by Trajan, after a victory over the Dacæ. It is the see of a bishop, suffragan of Sophia, and the residence of a fangiac; 164 miles N.W. of Adrianople. N. lat. $43^{\circ} 51'$. E. long. $24^{\circ} 8'$.

NICOPOLI, or *Glanich*, a town of Turkish Armenia, built by Pompey; 15 miles S. of Erzerum.—Also, a town of European Turkey, in Romania, on the Mæsto; 90 miles E.N.E. of Saloniki.

NICOPOLIS, or **NICOPOLI**, in *Ancient Geography*, a town of Greece, in Epirus; founded by Augustus as a monument of the victory obtained at Actium over Antony. Pliny represents it as a free town: Tacitus gives it the title of a Roman colony. Strabo informs us that Augustus, having collected into this place the inhabitants of the deserted towns in its vicinity, gave it the name of Nicopolis; and by way of distinguishing it from several other towns of the same name, called it "Achaïæ Nicopolis," or "Actia Nicopolis."

NICOPOLIS, or *Nicopolis ad Hæmum*, a town of Thrace, at the foot of mount Hæmus, towards the source of the river Iatrus; placed by Ptolemy between Prasidium and Oistaphos.

NICOPOLIS, a town of Lower Mœsia, at the mouth of the river Iatrus, on the Danube. In order to distinguish it from Nicopolis upon the Hæmus, built also upon the Iatrus, it was called "Nicopolis ad Danubium," or "Nicopolis ad Istrum." Ammianus Marcellinus says, that it was founded by Trajan, after his victory over the Dacians. See **NICOPOLI**.

NICOPOLIS, or *Nicopolis ad Nessum*, a town of Thrace, founded by Trajan, some leagues from the mouth, and to the left of the river Nessus. Ptolemy places it between Pantalía and Topiris.

NICOPOLIS, a town of Egypt, in the environs of Alexandria. Josephus places it at twenty stadia from Alexandria, in Judæa. According to Dion Cassius, Augustus was its founder, who gave it the same name, and conferred upon it the privilege of the same games with the town of Nicopolis in Epirus.—Also, a town of Asia, in Cilicia, situated in the mountains, on the river Pinarus, N.E. of its mouth.—Also, a town of Armenia Minor, built by Pompey according to Strabo. Ptolemy places it in the interior of the country, at a distance from the Euphrates, and in the vicinity of the mountains. By way of distinction from other towns, it was called "Nicopolis Pompeii."—Also, a town of Bithynia, on or near the Bosphorus.—Also, a town of Asia Minor, in Cilicia Propria, between Cestabula and Epiphania, according to Ptolemy. Strabo places it in the number of towns which were situated on the coast of the gulf of Issus.—Also, a town of Asia, in Phrygia Salutaris.—Also, a town of Palestine, previously called Emmaus. It was burnt, after the death of Herod the Great, by Quintilius Varus, for having taken part in the revolt of the Jews. This town was abandoned by its inhabitants, and reduced to the condition of a village, 60 stadia from Jerusalem. It was granted to 800 veteran soldiers by the emperor Vespasian, after the ruin of Jerusalem, A.D. 71. The

town was called Nicopolis, in commemoration of the victory of the Romans over the Jews. Under the reigns of Trajan and Antoninus Pius, this town was celebrated, and struck several medals. The name of Emmaus is given to this town by Ptolemy, in his Geography, and it was called Nicopolis by the Romans. It was ruined after the reign of Antonine, but re-established under Elagabalus and Alexander Severus; and the name of this latter emperor was added to its own.

NICOSIA, in *Geography*, a town of Sicily, in the valley of Demona; 32 miles N.W. of Catania.—Also, a town and capital of the island of Cyprus, situated in the middle of a vast plain, and in the centre of the island. It is now the residence of the governor, as it formerly was of the kings of Cyprus. The palaces of the sovereigns, remarkable for the beauty of their architecture, are abandoned by the Turks to destruction. The superb church of "Santa Sofia," in which the Christian kings were crowned, has been converted into a mosque; and the habitation of these sovereigns, partly demolished, and partly re-edified in the eastern taste, is the residence of the Moslem, or governor. The situation of the town is agreeable; streams are here abundant; and it is surrounded by fine gardens. The adjacent soil is excellent, and cultivated by the industry and activity of freemen, would resume the aspect of prosperity. This town was in a remote period a place of considerable extent; and some ruins indicate its former importance. It contained, in its more ancient state, within a circumference of nine miles, temples, palaces, and several beautiful monuments, and, at a later period, many monasteries, 300 churches, Greek and Latin, and a number of public edifices. In the year 1570, when Selim II., who then ruled the Ottoman empire, projected the conquest of Cyprus, it was taken, after a protracted siege, by an assault of Mustapha, the Turkish general; and of 50,000 people, who had retired within the walls for shelter, 20,000 were massacred, and the rest put in irons. Besides the church of St. Sophia, already mentioned, it had another church, viz. that of St. Nicholas, which is now a bezaften, or a kind of hall, in which all sorts of provisions are sold; it is a place where the principal Turkish, Greek, and Armenian merchants assemble to transact commercial business. The bazar, or market-place, is extensive, much frequented, well supplied with provisions, and kept in a neat and clean state. N. lat. $35^{\circ} 12'$. E. long. $33^{\circ} 2'$.

NICOTERÀ, a town of Naples, in Calabria Ultra, the see of a bishop, suffragan of Reggio, near the coast of the Mediterranean; 32 miles N.N.E. of Reggio. N. lat. $38^{\circ} 33'$. E. long. $16^{\circ} 16'$.

NICOTIANA, in *Botany*, received its name in honour of John Nicot, of Nismes, ambassador from the French court to that of Portugal, who during his residence at Lisbon, in 1560, received some of the seed from a Dutchman, who had it from Florida, and part of this he sent to France. There the plant soon became famous, as well as in other parts of Europe, by the name of Tabac, or Tobacco.—Linn. Gen. 99. Schreb. 133. Willd. Sp. Pl. v. 1. 1014. Mart. Mill. Dict. v. 3. Ait. Hort. Kew. ed. 2. v. 1. 390. Brown. Prod. Nov. Holl. v. 1. 447. Juss. 125. Lamarck Illustr. t. 113. Tourn. t. 41. Gærtn. t. 55.—Clafs and order, *Pentandria Monogynia*. Nat. Ord. *Lurida*, Linn. *Solanæ*, Juss. Brown.

Gen. Ch. *Cal.* Perianth of one leaf, inferior, tubular, ovate, cut half way down into five unequal segments, permanent. *Cor.* of one petal, funnel-shaped; tube longer than the calyx; limb more or less spreading, with five plaits, and five lobes. *Stam.* Filaments five, awl-shaped, ascending,

nearly as long as the corolla, often unequal; anthers oblong. *Pist.* Germen superior, ovate; style thread-shaped, as long as the corolla; stigma capitate, notched. *Peric.* Capsule nearly ovate, marked with a narrow furrow at each side, of two cells and two valves, bursting at the top into four parts. *Receptacles* half-ovate, dotted, affixed to the partition. *Seeds* numerous, kidney-shaped, rugged.

Eff. Ch. Corolla funnel-shaped; limb five-cleft, plaited. Stamens inclining. Capsule of two cells, and two valves, opening into four parts at the top. Calyx tubular, five-cleft.

1. *N. Tabacum*. Virginian Tobacco. Linn. Sp. Pl. 258. Willd. n. 1. Ait. n. 1. Woodv. Med. Bot. t. 60. Stokes's Mat. Med. v. 1. 390. (*Hyoscyamus peruvianus*; Ger. em. 357. Βλεννοχολος; Renealm. Spec. 38. t. 37.)—Leaves lanceolate-ovate, sessile, decurrent. Segments of the corolla acute. Native of America, from whence it was brought to Europe by sir Francis Drake, in the middle of the 16th century, and is now a hardy annual in our gardens, flowering in July and August. The herb rises to the height of six feet, and is of a rank coarse habit, downy, viscid and fœtid. *Leaves* alternate, clasping the stem, and decurrent, one or two feet long, flaccid, acute, entire; various in breadth. *Stem* round, branched, paniced, bearing abundance of long tubular, rose-coloured flowers. With us this plant is chiefly cultivated in the kitchen-garden, for private use, serving to fumigate the hot-houses, and drive away insects, in which it is all-powerful. Revenue laws forbid the raising of Tobacco for sale in England. For its more important qualities and uses, as well as its commercial history, see TOBACCO.

2. *N. fruticosa*. Shrubby Tobacco. Linn. Sp. Pl. 258. Regn. Bot. tab.—Leaves lanceolate, tapering at the base, clasping the stem. Segments of the corolla acute. Stem shrubby.—This is said to be a native of China. It has been cultivated in the English greenhouses for more than a century. We have seen it in the open air, in a garden near Naples, with a stem three or four inches in diameter, forming a small tree. Its woody perennial habit, and narrow leaves, which taper down into a sort of footstalk, that clasps the branch at its base, are the chief marks of distinction between this and the former, with which its flowers very nearly agree. We think Mill. Ic. t. 185. f. 1, may represent this species.

3. *N. undulata*. New Holland Tobacco. Ait. n. 3. Brown. Prodr. v. 1. 447. Venten Malmaif. t. 10. Sims in Curt. Mag. t. 673.—Radical leaves obovate, obtuse, somewhat wavy; stem-leaves sharp-pointed. Corolla salver-shaped, very obtuse.—Native of New South Wales, as well as of the southern part of New Holland. Brown. It came to Kew in 1800, and is perennial in the greenhouse, flowering all summer long. The settlers at Port Jackson are said to use this herb as Tobacco. It is downy, viscid and fœtid. *Leaves* and whole herb much smaller than in the Virginian Tobacco. *Flowers* racemose, drooping, large, white, with a green tube; fragrant at night like the *Mirabilis longiflora*. Their limb is nearly at a right angle with the tube, its segments rounded and obtuse, sometimes cloven. *Calyx* acutely ribbed and furrowed.

4. *N. plumbaginifolia*. Leadwort-leaved Tobacco. Viviani Hort. Dinegr. 26. t. 1.—Radical leaves ovate, contracted at the base; stem-leaves lanceolate, clasping the stem; all undulated. Corolla salver-shaped, acute.—The native country of this species is unknown. It has been cultivated in some Italian gardens, and we obtained flowering specimens, in May 1804, from the stove of the late lady Amelia Hume. The stem is much branched from the very bottom. *Leaves* broader than in the last, with which species the flowers most agree in colour, size, and arrangement,

but differ essentially in the acuteness of their segments. The *calyx* also is wider.

5. *N. axillaris*. Axillary Tobacco. Poiret in Lamarck Dict. v. 4. 480.—Leaves opposite, ovate, flat, nearly sessile. Stalks axillary, solitary, single-flowered. Corolla obtuse. Segments of the calyx deep, spatulate.—Gathered by Commerçon at Monte Video, and communicated by Thouin to the younger Linnæus. Of the lower *leaves* we know nothing; the upper are as above described, rather above an inch long, and near an inch wide, downy, and apparently viscid, like the rest of the herbage. Lower *flower-stalks* longer than the leaves, upper shorter. Segments of the *calyx* nearly equal, very deep and obtuse. *Corolla* white or yellowish, streaked and bordered with purple; its tube thrice the length of the calyx; limb obliquely twisted and folded in the bud, funnel-shaped when expanded, with slight blunt segments. *Fruit* unknown. It is evident that some uncertainty must attend the genus of this plant, till the whole of the fructification is known, but we have concurred with Commerçon and Poiret in making it a *Nicotiana*.

6. *N. trifida*. Dull-purple Tobacco.—Leaves lanceolate, wavy, clasping the stem. Corolla salver-shaped, its tube not twice the length of the calyx, and scarcely longer than the obtuse limb.—Gathered by Commerçon at Monte Video. The whole *herb* is viscid and downy. *Stem* somewhat branched, from one to two feet, or more, in height. Radical *leaves* roundish-ovate, or obovate; those on the stem lanceolate, dilated and clasping the stem at their base; all wavy or somewhat crisped at the margin. *Flowers* racemose, the lower ones accompanied by gradually diminished leaves. *Flower-stalks* seldom so long as the *calyx*, which is cut half way down into five unequal, linear, obtuse, erect segments. *Corolla* of a dull purple, salver-shaped; tube an inch long, being not twice the length of the calyx, cylindrical; limb rather shorter than the tube, its segments roundish, obtuse, horizontal, plaited. One of the *stamens* shorter than the rest.

7. *N. rustica*. Common Green Tobacco. Linn. Sp. Pl. 259. Willd. n. 3. Ait. n. 4. (*Hyoscyamus niger*; Matth. Valgr. v. 2. 412. *H. luteus*; Ger. em. 356.)—Leaves stalked, ovate, entire. Tube of the corolla bell-shaped, not twice the length of the calyx; segments of the limb rounded, spreading, one-fourth as long as the tube.—Native of America, from whence it was brought about the same time as the *N. Tabacum*, which it resembles in qualities. This is a hardy annual in our gardens, flowering from Midsummer to Michaelmas. The *stem* is three or four feet high, leafy with panicked *branches*. *Leaves* from three to six inches long, of a broad ovate, or somewhat heart-shaped, obtuse figure, on *stalks* one or two inches in length. *Flowers* numerous, scarcely an inch long, of a dull yellowish-green, bell-shaped. Segments of the *calyx* semi-ovate. *Cap-sule* roundish, a little depressed. Every part is downy, clammy, and fetid, as in the rest of the genus. Gerarde says of this plant that “taken in smoke, it worketh the same kind of drunkenness that the right Tobacco doth.”

8. *N. paniculata*. Panicked Tobacco. Linn. Sp. Pl. 259. Stockh. Transf. for 1753. 40. t. 1. Willd. n. 4. Ait. n. 5. (*N. minor*, folio cordiformi, tubo floris prælongo; Feuill. Peruv. v. 1. 717. t. 10.)—Leaves stalked, heart-shaped, entire. Panicles much branched. Tube of the corolla club-shaped, five times as long as the calyx; limb very short, spreading, with shallow rounded lobes.—Native of Peru. Linnæus received the seeds from Bernard de Jussieu, and having raised the plant, published it in the Stockholm Transactions. This differs from the last in its much more lax and compound *panicles*, and especially in the length and

slender club-shaped figure, of the *corolla*, though its colour is nearly the same. Feuillée, who discovered this plant in the valley of Lima, says not a word of its being applied to any particular use.

9. *N. urens*. Prickly Tobacco. Linn. Sp. Pl. 259. Willd. n. 5. (*N. arborefcens spinosissima*, flore exalbido; Plum. Cat. 3. Ic. 204. t. 211.)—Leaves stalked, heart-shaped, crenate. Spikes recurved, many-flowered. Stem hispid. Tube of the corolla bell-shaped; limb revolute.—Gathered in South America, or the West Indies, by Plumier. No other botanist appears to have seen it. Our only guides therefore are his figure and short definition. This seems to be a very large plant. The *leaves* are above a foot long, heart-shaped; their margin wavy and crenate. *Stem* and *stalks* densely clothed with pungent bristles. Branches of the *panicle* alternate, very long, recurved, spiked rather than racemose, the copious *flowers* being nearly, or quite, sessile. Segments of the *calyx* deep, lanceolate, acute. *Corolla* above an inch long; its tube wide and bell-shaped; segments of the limb revolute, acute.

10. *N. glutinosa*. Clammy, or Spanish, Tobacco. Linn. Sp. Pl. 259. Willd. n. 6. Ait. n. 6. Andr. Repof. t. 484. (Andra nya Tobaken; Linn. Stockh. Transf. for 1753. 41. t. 2.)—Leaves stalked, heart-shaped, acute, entire. Flowers racemose, drooping, somewhat ringent. Calyx as long as the tube.—Native of Peru. A hardy annual with us, flowering in the latter part of summer, but not valuable for its beauty. The broad, heart-shaped, acute, wavy *leaves* are unlike those of any other species cultivated here; and the curved, somewhat ringent *corolla*, scarcely longer than the linear-lanceolate segments of the *calyx*, is characteristic. Its colours are nearly those of the first and second species, but less vivid. Burmann, the editor of Plumier, points out the affinity of this and the last, but they cannot be confounded. The stalked *leaves* agree in that particular with Gerarde's *Sana sana Indorum*, p. 357. f. 2, the cut of which, printed likewise in other old books, has hitherto been confounded with *N. Tabacum*, with which indeed the *flowers* accord, and not at all with the species before us. We conceive this cut relates to some species not hitherto ascertained by recent botanists; for though *N. Tabacum* varies in the length and breadth of its *leaves*, their taper base, and the want of *footstalks*, is abundantly unlike the figure to which we allude.

11. *N. pusilla*. Primrose-leaved Tobacco. Linn. Sp. Pl. 258. Willd. n. 7. (*N. foliis ovato-lanceolatis, obtusis, rugosis, calycibus brevissimis*; Mill. Ic. v. 2. 124. t. 185. f. 2.)—Radical leaves elliptic-oblong, rugose; stem-leaves ovate, small. Flowers racemose. Tube of the corolla club-shaped, five times as long as the calyx; limb acute.—Native of Vera Cruz, from whence Houftoun sent the seeds to Miller. It is biennial, flowering in the stove in August. *Stem* a span high, with racemose *branches*, of slender yellowish-green *flowers*, whose *corolla* is not an inch long. The *leaves* are chiefly radical, resembling those of the primrose, but darker.

Tabacum minimum, Ger. em. 358, appears to be another species, hitherto unsettled, with a branched leafy *stem*, a span high; *leaves* ovate, on *footstalks*, opposite; and stalked, acute, greenish-yellow *flowers*. Having seen no specimen, we leave it for future enquiry.

N. minima of Molina, Poir. in Lam. Dict. v. 4. 481, is also probably another species unknown to us. S.

NICOTIANA, in *Gardening*, contains plants of the herbaceous annual kind, of which the species cultivated are the shrubby tobacco (*N. fruticosa*); the Virginian tobacco (*N. tabacum*); and the common or English tobacco (*N. rustica*.)

In the first there is a variety which rises about five feet high; the stalk does not branch so much as that of the real plant; the leaves are large and oval, about fifteen inches long, and two broad in the middle, but diminish gradually in size to the top of the stalk, and, with their base, half embrace it; the flowers grow in closer bunches than those of the original, and are white: they are succeeded by short, oval, obtuse seed-vessels. It flowers about the same time with the sort from which it comes, and grows naturally in the woods of the island of Tobago.

Of the second species there are several varieties; as the great broad-leaved, in which the leaves are more than a foot and a half long, and a foot broad, their surfaces very rough and glutinous, and their bases half embrace the stalk. In a rich moist soil the stalks are more than ten feet high, and the upper part divides into smaller branches, which are terminated by loose bunches of flowers standing erect; they have pretty long tubes, and are of a pale purplish colour. It flowers in July and August, and is the sort commonly brought to market in pots, being sometimes called Oronoko tobacco.

And there is another variety, in which the stalks seldom rise more than five or six feet high, and divide into more branches. The leaves are about ten inches long, and three and a half broad, smooth, acute, sessile; the flowers are rather larger, and of a brighter purple colour. It flowers at the same time; and is called by some sweet-scented tobacco.

The narrow-leaved variety rises with an upright branching stalk, four or five feet high. The lower leaves are a foot long, and three or four inches broad: those on the stalks are much narrower, lessening to the top, and end in very acute points, sitting close to the stalks; they are very glutinous. The flowers grow in loose bunches at the top of the stalks; they have long tubes, and are of a bright purple or red colour. They appear at the same time with the former. These varieties are also all natives of America.

The third species has also a variety which rises with a strong stalk near four feet high; the leaves are shaped like those of the preceding, but are greatly furrowed on their surface, and near twice the size, of a darker green, and on longer footstalks. The flowers are of the same shape, but larger.

Method of Culture.—The two first sorts may be increased by sowing the seeds annually in the spring, as March, on a hot-bed, the last in the natural ground. The seeds should be covered about a quarter of an inch deep; and when the plants are come up, they should be allowed fresh air daily, and occasional watering, managing them as tender annuals. When the plants are from three to six inches high, as in May or the following month, they should be planted out in moist weather, in the open ground; such as are designed for ornament singly, and those intended for use, in rows, any where, three feet asunder; giving a good watering as soon as planted, repeating it occasionally till the plants have got fresh root.

The second species may also be raised by sowing the seeds in a warm border in April, for setting out in the same manner, or by sowing in patches in the flower-borders, &c. to remain, thinning the plants afterwards to one in each patch.

In the third sort the seeds may be sown in any bed or border in the spring, raking them in lightly. When the plants are three inches high, they should be planted out where they are to remain; or they may be sown in patches to remain, thinning the plants out afterwards, as above. But in America, where regular plantations are made, the method is this:

The beds being prepared, and well turned up with the hoe, the seed, on account of its smallness, is mixed with ashes, and sown upon them, a little before the rainy season. The beds are raked, or trampled with the feet, to make the seed take the sooner. The plants appear in two or three weeks. As soon as they have acquired four leaves, the strongest are drawn up carefully, and planted in the field by a line, at the distance of about three feet from each plant. If no rain fall, they should be watered two or three times. Every morning and evening the plants must be looked over, in order to destroy a worm which sometimes invades the bud. When they are about four or five inches high, they are to be cleaned from weeds, and moulded up. As soon as they have eight or nine leaves, and are ready to put forth a stalk, the top is nipped off, in order to make the leaves longer and thicker. After this, the buds which sprout at the joints of the leaves are all plucked, and not a day is suffered to pass without examining the leaves, to destroy a large caterpillar which is sometimes very destructive to them. When they are fit for cutting, which is known by the brittleness of the leaves, they are cut with a knife close to the ground; and, after lying some time, are carried to the drying shed or house, where the plants are hung up by pairs, upon lines, leaving a space between that they may not touch one another. In this state they may remain to sweat and dry. When perfectly dry, the leaves are stripped from the stalks, and made into small bundles tied with one of the leaves. These bundles are laid in heaps, and covered with blankets. Care is taken not to overheat them, for which reason the heaps are laid open to the air, from time to time, and spread abroad. This operation is repeated till no more heat is perceived in the heaps, and the tobacco is then stowed in casks for exportation. But in China, where the use of tobacco both in snuff and for smoking is very general, buildings are not thought necessary, according to sir George Staunton, as they are in the West Indies, for curing it; there being little apprehension of rain to injure the leaves when picked. They are hung on cords to dry without any shelter, upon the spot in which they grow.

It is probable that this plant might be grown with advantage in this climate, if it were not prohibited by the duty.

These sorts, when cultivated for the purpose of ornament, produce a fine effect by their leaves and flowers in the autumn, and also afford much variety.

NICOYA, or ST. LUCAR, in *Geography*, a town of Mexico, in the province of Costa Rica, on a river which runs into the Pacific ocean. From hence the inhabitants send to Panama salt, honey, maize, wheat, fowls, and the purple juice of a shell-fish found in the bay of Salinas, about 30 miles E. of the town. The Spaniards have also a pearl fishery; 80 miles W. of Carthage. N. lat. $10^{\circ} 36'$. W. long. $85^{\circ} 50'$.

NICSAR, or NIKSAR, a town of Asiatic Turkey, in Caramania, the see of an archbishop; situated in a valley, and at the extremity of a plain watered by the Kalki Irmak, which discharges itself into the Amasia, and is thus conveyed into the Black sea. The approaches to Niksar are said to exceed, if possible, in beauty and rich vegetation those to Karakissar. It is a long town, crowned by a ruined fort of considerable extent: the walls and towers appear to be works of the Saracenic age, and at a distance exhibit a picturesque object; though they would now afford but an impotent defence. A stream from the hills rushes through the valley, and turns the wheels of many mills for cutting the pines into planks. The houses are no longer terraced; their roofs are mostly of wood, shelving, and covered with tiles.

The

The ancient "Neocæsarea" may be easily recognised under the name of Niksar; and it is interesting as the city and bishopric of St. Gregory Thaumaturgus, who found there but 17 Christians, and left but 17 Pagans. He built a church in this city, under Philip, who commenced his reign in the year 241; and this, according to Tillemont, was the first of which history gives us any certain account. This town is placed by Morier, in his "Journey through Persia, &c." at 30 miles from Tocat. N. lat. $30^{\circ} 25'$. E. long. $85^{\circ} 50'$.

NICTAU, a river of Nova Scotia, which runs into the sea at Annapolis. On its banks are quantities of bog and mountain ore, where a bloomery is erected.

NICTITATING MEMBRANE, in *Anatomy*, a thin membrane, which covers the eyes of several creatures, and shelters them from dust, or too much light; yet is so thin, that they can see indifferently well through it.

This nictitating membrane is chiefly found in the bird and fish kind.

This membrane, in the eagle's eye, is remarkably close and firm, inasmuch as to be accounted as a second eye-lid; and hence that remarkable firmness of the eagle's sight in viewing the sun. See *Anatomy of BIRDS*.

NICUESA, *Gulf of*, in *Geography*, lies on the east coast of the country of Honduras, on the Spanish main, having Cape Gracias-a-Dios for its north limit, and Cape Blanco on the south; and due west from Catherine or Providence. N. lat. $13^{\circ} 42'$.

NIDA, a town of Prussia, in the province of Natangen; 12 miles W.S.W. of Lick.

NIDDA, a town of the principality of Upper Hesse; 38 miles E.N.E. of Mentz. N. lat. $50^{\circ} 26'$. E. long. $9^{\circ} 2'$.

NIDDUI, in the *Jewish Customs*, is used to signify separated or excommunicated. This, according to some, was to be understood of the lesser sort of excommunication in use among the Hebrews. He that had incurred it was to withdraw himself from his relations, at least to the distance of four cubits: it commonly continued a month. If it was not taken off in that time, it might be prolonged for sixty, or even ninety days: but if, within this term, the excommunicated person did not give satisfaction, he fell into the *cherem*, which was a second sort of excommunication; and thence into the third sort, called *shammatha*, or *shematta*, the most terrible of all. But Selden has proved that there were only two kinds of excommunication, *viz.* the greater and less; and that these three terms were used indifferently.

NIDDYCORDA, in *Geography*, a town of Hindoostan, in Madura; 30 miles N.E. of Coilpetta.

NIDEN, a town of Prussia, in the province of Samland, on the Frisch Nerung; 25 miles S. of Memel.

NIDENSTEIN, a town of the principality of Hesse; 7 miles S. of Cassel.

NIDERNDORFF, a town of Austria; 12 miles N.N.W. of Gram.

NIDERWOLTZ, a town of the duchy of Stiria; 8 miles N.E. of Muckrau.

NIDGET, in *Agriculture*, a term applied to a sort of harrow formed in a triangular manner, which is employed in the culture of hops, and which may be employed with advantage in cleaning other sorts of sowed crops. See *HOP*.

NIDJIBABAD, or NIDJIBUR, in *Geography*, a town of Hindoostan, in Oude; built by Najab-ud-Dowlah, as a convenient mart between Hindoostan and Cachemire; 80

miles N.N.E. of Delhi. N. lat. $29^{\circ} 35'$. E. long. $78^{\circ} 41'$.

NIDUM, in *Ancient Geography*, a town of Britain, marked in Antonine's Itinerary, between Bomium and Icalegua Augusta or Caerleon. Nidum is fixed by Camden, Gale, and Baxter, at Neath, in Glamorganshire; but the real course of the road from Maridunum to Icalegua Augusta is confessedly very uncertain.

NIDUS, NEST, a repository, wherein certain animals, particularly fowls, insects, and reptiles, lodge their eggs, for incubation; and wherein, when hatched, they nurse their young, till they become able to shift for themselves.

The word is Latin, and is supposed to be derived from *nidor*, a rank or ill smell: in regard the nests of animals usually stink.

Dr. Derham says, he has often wondered how wasps, hornets, and other insects, that gather dry materials, (as the dust of wood scraped for that purpose,) should find a proper glutinous matter to cement and glue their combs, and line their cells: but he adds, that, in all probability, it is in their own bodies; as in the *tinea vestivora*, the cad-worm, &c.

Goedart observes of his erucas, that fed on leaves, that they made their cells of leaves glued together with their own spittle.

NIDUS *Avis*, in *Botany*, Bird's Nest. See NEOTTIA, and EPIPACTIS, n. 9.

NIEBLA, in *Geography*, a town of Spain, in the province of Seville, situated on the river Tinta, containing three parishes and a convent, with about 3000 inhabitants. It is supposed to have been founded on the site of an ancient town called "Cunilorges." It was formerly the capital of a small Moorish kingdom, and taken by the Christians in the 13th century; 11 miles N.E. of Moguer. N. lat. $37^{\circ} 19'$. W. long. $6^{\circ} 46'$.

NIEBOLW, a town of Poland, in Galicia; 32 miles S.W. of Halitsch.

NIECE, a term relative to uncle and aunt, signifying a brother's or sister's daughter; which, in the civil law, is the third degree of consanguinity; and, in the common law, the second.

NIECHOROSSCZA, in *Geography*, a town of Poland, in the palatinate of Kiev; 56 miles W.S.W. of Kiev.

NIECHOROZ, a town of Poland, in the palatinate of Kiev; 56 miles W.S.W. of Kiev.

NIEDERBRONN, a town of France, in the department of the Lower Rhine, and chief place of a canton, in the district of Wissembourg; 12 miles S.W. of Wissembourg. The place contains 1438, and the canton 13,811 inhabitants, on a territory of 185 kilometres, in 20 communes.

NIEDEROLM, a town of France, in the department of Mont Tonnerre, and chief place of a canton, in the district of Mayence. The place contains 591, and the canton 9413 inhabitants, in 18 communes.

NIEDZWIEDTOZE, a town of Lithuania, in the palatinate of Novogrodek; 26 miles W.S.W. of Sluck.

NIEHUS, or NEUHAUSZ, a town of Germany, in the duchy of Saxe-Lauenburg; 8 miles W. of Thonundamm.

NIEKE CORONDE, in the language of the Ceylonese, the name of a species of cinnamon. The tree which produces it resembles the nieke, another tree very common there. This is a very bad kind of cinnamon, and has very little taste or smell. It is very seldom sold as cinnamon, but is much in esteem among the natives for its medicinal virtues. They obtain a water, and an oil from it, by roasting, which they

they anoint themselves with, to preserve them from noxious fumes, and infections of any kind; and use the expressed juice of the leaves to cool the head, and strengthen the brain, rubbing it on externally. Phil. Trans. N° 409.

NIEL, in *Geography*, a small island near the west coast of Scotland. N. lat. $55^{\circ} 58'$. W. long. $5^{\circ} 32'$.

NIELECOHOLO, a town of Chinese Tartary. N. lat. $42^{\circ} 1'$. E. long. $124^{\circ} 17'$.

NIEMANOWICZE, a town of Lithuania, in the palatinate of Troki; 48 miles N. of Grodno.

NIEMECK, a town of Saxony; 18 miles N. of Wittemberg. N. lat. $52^{\circ} 4'$. E. long. $12^{\circ} 40'$.

NIEMECZ, or NIMIEC, a strong town of European Turkey, in Moldavia, situated on a mountain, at the foot of which runs a river of the same name, which discharges itself in the Moldava; 76 miles W.N.W. of Jassi. N. lat. $47^{\circ} 23'$. E. long. $25^{\circ} 58'$.

NIEMECZYN, a town of Lithuania, in the palatinate of Wilna; 12 miles N.E. of Wilna.

NIEMEN, a river that takes its rise a few miles south of Minsk, in Lithuania, and passing by Grodno, joins the Wilna at Kowno; and soon afterwards entering Prussia, changes its name to Memel.

NIEMERSAT, a town of Prussia, in Samland, near the Baltic; 8 miles N. of Memel.

NIEMI, a town of Sweden, in West Bothnia; 44 miles N. of Tornea.

NIEMUROW, a town of Poland, in the palatinate of Belcz; 36 miles S.W. of Belcz.

NIENBERG, a town of the duchy of Berg; 6 miles S.S.E. of Wipperfurth.

NIENBORG, a town of Westphalia, in the bishopric of Munster, on the Dinkel; 21 miles N.W. of Munster. N. lat. $52^{\circ} 9'$. E. long. $6^{\circ} 51'$.

NIENBURG, a town of Germany, in the county of Hoya, on the Wefer; 12 miles S.S.E. of Hoya. N. lat. $52^{\circ} 38'$. E. long. $9^{\circ} 21'$.—Also, a town of Germany, called *Munch Nienburg*, in the duchy of Anhalt Cothen, situated on the Saale, and containing the prince's palace and a church; 8 miles N.W. of Cothen. N. lat. $51^{\circ} 53'$. E. long. $11^{\circ} 50'$.

NIENDORP, a town of the duchy of Holstein; 5 miles E.S.E. of Gluckstad.

NIENHOFF, a town of Holstein; 11 miles N.N.W. of Arensbock.

NIENHUS, or NIEUHAUS, a town of Germany, in the county of Bentheim, seated on the Dinkel, near its confluence with the Vechte; 17 miles S.E. of Covorden. N. lat. $52^{\circ} 33'$. E. long. $6^{\circ} 50'$.

NIENKIRCHEN, the name of three towns in the duchy of Holstein.

NIENRADE, or DRECHROIDE, a town of Westphalia, in the county of Mark; 20 miles S. of Dortmund. N. lat. $51^{\circ} 12'$. E. long. $7^{\circ} 50'$.

NIENT COMPRISE, in *Law*, an exception taken to a petition, as unjust; because the thing desired is not in that act or deed whereon the petition is grounded.

Thus a person desiring of the court to be put in possession of a house, formerly adjudged to him among other lands; the adverse party pleads, that the petition is not to be granted, by reason though the petitioner had a judgment for certain lands and houses, yet this house is nient comprise, not comprised therein.

NIENT Culpable. See *Non est culpabilis*.

NIEOU-TCHUANG, in *Geography*, a town of Chinese

Tartary; 300 miles E.N.E. of Peking. N. lat. 41° . E. long. $122^{\circ} 18'$.

NIEPA, a town on the north coast of the island of Cuba; 55 miles N. of St. Yago.

NIEPER. See DNIEPER.

NIEPOLOMICE, a town of Poland, in the palatinate of Cracow; 10 miles E. of Cracow.

NIER, a small river of Ireland, which flows from the Waterford mountains to the river Suire.

NIEREDOWA, a town of Lithuania, in the palatinate of Troki; 10 miles N. of Birza.

NIESAWAY, or NIESOVIA, a town of Persia, in the province of Schirvan, with a harbour, on the east coast of the Caspian sea; 45 miles S.S.E. of Derbend.

NIESOLONE, a town of Poland, in Volhynia; 34 miles N.W. of Zytomiers.

NIESTER. See DNIESTER.

NIESUCHWIESCHOWZA, a town of Poland, in Volhynia; 33 miles N.W. of Lucko.

NIESWICZ, a town of Lithuania, in the palatinate of Novogrodek; 24 miles N.W. of Sluck.

NIESYCE, a town of Lithuania, in the palatinate of Minsk; 44 miles N.E. of Minsk.

NIETRO, a river of Naples, which runs into the gulf of Tarento. N. lat. $39^{\circ} 12'$. E. long. $17^{\circ} 24'$.

NIEVA, an island south-west of Mistake bay, in Hudson's straits.

NIEUIL, a town of France, in the department of the Upper Vienne, and chief place of a canton, in the district of Limoges; 7 miles N.W. of Limoges. The place contains 671, and the canton 5126 inhabitants, on a territory of $137\frac{1}{2}$ kilometres, in 6 communes.

NIEUKERK, a town of Guelderland, near the Zuyder See; 8 miles S.S.W. of Harderwyck.

NIEUPORT, a sea-port town of France, in the department of the Lys, and chief place of a canton, in the district of Furnes; which name it assumed when Philip, comte of Flanders, built a harbour in 1168. It lies near the sea-shore, on a branch of the river Yperlee, which, by its junction with the river Colme, forms a canal that runs into the sea. The harbour at low-water is dry. The place is chiefly defended by its sluices, by which the adjacent country may be inundated. After the peace of Utrecht in 1713, the French ceded this town to the English, who, in 1715, surrendered it to his Imperial and Catholic majesty Charles VI. But being taken again by the French in 1745, it was restored at the peace of Aix-la-Chapelle. Before the French revolution, here was a convent of English Chartreux, founded at Shene in 1415 by Henry V.; and in the reign of queen Elizabeth, removed first to Malines, and at last established at Nieuport in the year 1626. It is inhabited chiefly by fishermen, and its chief trade consists in nets and cordage for vessels. In 1794 it was taken by the French; 9 miles S.W. of Ostend. The place contains 2983, and the canton 7533 inhabitants, on a territory of $207\frac{1}{2}$ kilometres, in 19 communes. N. lat. $51^{\circ} 7'$. E. long. $2^{\circ} 33'$.—Also, a town of Holland, on the Leck; 15 miles E. of Rotterdam.

NIEUWE DIER, a harbour on the north coast of Holland, taken possession of by the English fleet in 1799; and near it is a magazine, called "Nieuwe Werk," taken by the English at the same time; 6 miles E. of Helder.

NIEUWELD and *The Ghoup*, are continuations of the Roggeveld mountain, in the district of Stellenbosch and Drakenstein, which adjoin the Cape district, in the southern part of Africa. These divisions join others of the same name

name in the district of Graaf Reynet. They have lately been deserted, on account of the number of Bosjesman Hot-tentots who dwell close behind them.

NIEUWENTYT, **BERNARD**, in *Biography*, a celebrated Dutch philosopher and mathematician, was born at Westgraafdyk, in North Holland, in the year 1654. His father was a minister, and he wished to educate the son for the same profession; but finding him disinclined to such a destination, he suffered him to follow his own inclination. He studied philosophy according to the system of Des Cartes, then engaged in mathematical pursuits, and became intimately acquainted with the abstruse sciences. He next studied medicine, and then went through a course of reading on jurisprudence. In the study of all these sciences he succeeded so well, as deservedly to acquire the character of a good philosopher, a deep mathematician, and an able and just magistrate. From his writings it also appears, that he did not permit his various studies and subjects of inquiry to divert his thoughts from a due attention to the great and fundamental principles of natural and revealed religion. He was naturally of a grave and serious disposition, but at the same time a very affable and agreeable companion. His manners were so engaging, that they conciliated the esteem of all his acquaintance: hence he acquired great credit and influence in the council of the town of Purerende, where he resided; and also in the states of that province, who respected him the more because he never engaged in any cabals or factions, but recommended himself only by an open, manly, and upright behaviour. He died in the year 1718, at the age of 63. He was author of many works on different subjects, among which are the following: "Considerationes circa Analyseos ad Quantitates infinitè parvas applicatæ Principia, &c." in which he proposed some difficulties on the subject of the analysis of infinitesimals; "Analysis Infinitorum, seu Curvilinearum proprietates, ex Polygonorum deductæ, &c.;" "The proper Use of the Contemplation of the Universe, for the Conviction of Atheists and Unbelievers." This was published in 4to., in the year 1715; of which a French translation was published at Paris in 1725, entitled "L'Existence de Dieu démontrée par les Merveilles de la Nature;" and one in English, in 3 vols. 8vo., under the title of "The religious Philosopher, or the right Use of contemplating the Works of the Creator." This went through several editions, and was highly esteemed. A work of a similar kind, adapted to the present improved state of science, has been some years in hand by the author of the "Scientific Dialogues." Nieuwentyt, only a few weeks before his death, finished an excellent refutation of Spinoza, which was published in Dutch at Amsterdam, in 1720. Moreri.

NIEZABAD, **NIASABAD**, or *Niesovaia Pristan*, in *Geography*, a town of Persia, in the province of Schirvan, with a harbour on the Caspian sea; 40 miles S. of Derbend. This was formerly the most frequented by the Russians, and chiefly visited by the merchants of Shamakee, who supplied the province of Schirvan with European commodities. Near the harbour are several wretched villages. N. lat. 41° 18'.

NIF, a town of Asiatic Turkey, in Natolia; 16 miles E. of Smyrna.

NIFAN, or **NIBAN**, a town of Arabia, in the province of Oman; 80 miles S.W. of Hasek.

NIFFO, a town of Africa, on the Grain coast.

NIFO, **AGOSTINO**, in *Biography*, a celebrated philosopher and man of letters, was born either at Jopoli, in Calabria, or Sessa, in Terra di Lavoro. Having received a

good education, he quitted his father's house, which had been made uncomfortable to him by a mother-in-law, and went to Naples, where he undertook the instruction of youth. He accompanied some of his scholars to Padua, where, in 1492, he was chosen professor extraordinary of philosophy. He was afterwards advanced to the professorship in ordinary, and to the first chair. During his abode at Padua he embraced the doctrine of the unity of the spiritual substance, and that there is only one soul and intellect that animates all nature. This he maintained in a treatise "De Intellectu et Dæmonibus," which brought on him a formidable attack from the abettors of established opinions, under which he would, probably, have sunk, had not Barazzi, bishop of Padua, kindly interposed, and persuaded him to retract certain offensive passages in his work. Leaving Padua he resided some time at Sessa, where he married, and had several children, and from this, his favourite residence, he is frequently denominated *Suffanus*. His reputation was now spread throughout Italy, and he was successively invited to various schools of learning. By the prince of Salerno he was engaged to teach philosophy for some time in that city. About the year 1510 he held a chair in the university of Naples. In 1513 he was invited to Rome by Leo X., who honoured him with the title of count palatine, and, at the same time, conferred upon him the privilege of using the name and arms of the Medici; he was, at one time, a professor at Rome, in the college of Sapienza, and, at another, he occupied a chair at Bologna. In 1519 he removed to Pisa, where he was offered a salary of seven hundred gold florins. The prince of Salerno drew him again to that city in 1525, in which, or at Sessa, he probably passed the remainder of his days. The time of his death is uncertain, some writers fix it in 1537, but others adduce a dedication of his to Paul III. in 1545, as a proof that he was living at that period. It is, however, generally admitted that he died in 1538. Nifo was a man of mean and forbidding aspect, but he was a very pleasant companion; he lived chiefly among the great, and seems (which happens to but few literary characters,) to have been in easy circumstances, and he had a very valuable library. He wrote a great number of works relative to the peripatetic philosophy, astronomy, and medicine; rhetoric, ethics, politics, &c. Commentaries and translations of the works of Aristotle and Averrhoës compose the greater part of them. It is said that he refused the importunities of astrologers, and was the first to deliver Europe from the terrors of a deluge which had been predicted for the year 1524. Roscoe's Life of Leo X. See also Bayle's Dict.

NIGANISH, in *Geography*, a town or valley on the E. coast of the island of cape Breton. N. lat. 46° 40'. W. long. 60° 15'.

NIGATA, a sea-port of Japan, on the N. coast of the island of Niphon. N. lat. 37° 30'. E. long. 139° 10'.

NIGDEH, or **NIKDE**, a town of Asiatic Turkey, in Caramania, surrounded with walls, and defended by a castle; 44 miles S.E. of Akferai. N. lat. 38° 7'. E. long. 35° 10'.

NIGELLA, in *Botany*, from *niger*, black, in allusion to the colour of the seeds; it being unquestionably the *μαλανθιον* of Dioscorides, so called with the same meaning. Linn. Gen. 276. Schreb. 370. Willd. Sp. Pl. v. 2. 1248. Mart. Mil. Dict. v. 3. Ait. Hort. Kew. ed. 2. v. 3. 326. Sm. Prod. Fl. Græc. Sibth. v. 1. 373. Juss. 233. Tourn. t. 134. Lamarck Illustr. t. 488. Gærtn. t. 118. Class and order. *Polyandria Pentagynia*. Nat. Ord. *Mutisifluæ*, Linn. *Ranunculaceæ*, Juss.

Gen.

NIGELLA.

Gen. Ch. *Cal.* none. (The floral leaves in some species are in danger of being mistaken for one.) *Cor.* Petals five, ovate, flat, obtuse, spreading, contracted at the base. Nectaries from five to ten, short, stalked, ranged in a circle, each two-lipped; the outer or inferior lip larger, cloven, somewhat convex, marked with two dots; the inner shorter, narrower, ovate with a linear termination. *Stam.* Filaments numerous, awl-shaped, shorter than the petals; anthers compressed, obtuse, erect. *Pist.* Germens feveral, five or ten, superior, oblong, combined, compressed, erect; styles terminal, awl-shaped, angular, very long but revolute, permanent; stigmas longitudinal, lateral. *Peric.* Capsules as many as there were germens, oblong, compressed, pointed, connected by their inner margins, opening at the upper part of the inner margin. *Seeds* numerous, angular, rough.

Eff. Ch. Calyx none. Petals five. Nectaries from five to ten, three-cleft, two-lipped, within the petals. Capsules five, connected.

Obf. Willdenow, by an error of the prefs, has *capsula convexa*, for *connexa*. This union of the capsules is, in feveral species, so complete, as to form apparently one simple globose seed-vessel, of five cells. See Dr. Sims's excellent remarks in Curt. Mag. v. 31, under t. 1264.

Section 1. *Styles five.*

1. *N. damascena*. Common Fennel-flower. Love in a mist. Devil in a bush. Linn. Sp. Pl. 753. Curt. Mag. t. 22. (Melanthium damascenum; Ger. em. 1084. M. sylvestre; Matth. Valgr. v. 2. 152. With a double flower, Nigella flore albo multiplici; Ger. em. 1085.)—Flowers furrounded with a leafy involucre. Fruit globose, smooth.—Native of corn-fields in the south of Europe, and for 250 years past a common hardy annual in our gardens, especially the double kind, varying with white or pale-blue petals. The root is small, whitish. Stem erect, one or two feet high, branched and bushy, smooth like every other part. Leaves alternate, doubly or triply pinnatifid, as finely cut as those of Fennel, but flat; the segments spreading, linear and acute, those at the bottom much crowded. Flowers terminal, solitary, encompassed and overtopped by a circle of leaves, much like the rest. Nectaries five, alternate with the petals; their claw purple; limb green, bent upward at a right angle, with a spreading, purple, flat, bluntly two-lobed, hairy under lip, destitute of any horns or appendages. The petals in the double variety are multiplied, but numerous stamens remain to perform their office. The united inflated capsules form a smooth, almost membranous, globe, crowned with the wavy spreading styles. The seeds when bruised have a luscious fragrance. Gardeners keep a dwarf variety, more condensed in its habit, with small white petals.

2. *N. ariflata*. Athenian Fennel-flower. Sm. Prod. Fl. Græc. Sibth. v. 1. 373. Fl. Græc. t. 510, unpublished.—Flowers furrounded with a leafy involucre. Nectaries and anthers awned. Capsules turbinate, rough.—Gathered by Dr. I. Sibthorp near Athens. This is more branched than the preceding, but the leaves, flowers and involucre are smaller. The petals are heart-shaped, with long claws, and pointed. Under lip of the nectaries a beautiful object when somewhat magnified, being almost triangular, pale yellow, with a broad transverse blue stripe bordered with purple, and having two ascending horns in front, annulated with red; the whole clothed with long hairs. The capsules are oblong, triply keeled, rough with granulations, and combined merely at their inner edges, spreading at the top, not globose nor inflated, but agreeing with most of the following species, not at all with the preceding.

3. *N. sativa*. Small Fennel-flower, or Gith. Linn.

Sp. Pl. 753. Fl. Græc. t. 511, unpublished. Zorn Ic. t. 119. (N. cretica; Bauh. Prod. 75. Melanthium fativum; Matth. Valgr. v. 2. 151. Camer. Epit. 551. Melanthium n. 1.; Ger. em. 1084.)—Involucre none. Fruit somewhat globose, rough. Nectaries hairy, with blunt points. Petals ovate. Leaves rather hairy.—Native of the Levant; common in Greece and the Archipelago. Dr. Sibthorp determines this species to be the real *μελάνθηον* of Dioscorides, and records, in his manuscripts, that the modern Greeks still retain the custom, mentioned by this ancient writer, of sprinkling its seeds upon their bread. In England it is seldom cultivated but for curiosity, being less handsome than some other kinds. The stem is less branched, and leaves broader, than in either of the preceding. Petals, and ten nectaries, pale blue or nearly white, the lower lip of the latter hairy, ending in two blunt or knobbed points, and marked with a transverse violet stripe. Capsules combined, nearly as in *N. damascena*, but rough. The anthers are beaked, as in the last.

4. *N. arvensis*. Field Fennel-flower.—Linn. Sp. Pl. 753. Fl. Græc. t. 512, unpublished. (Melanthium sylvestre; Ger. em. 1084. M. sylvestre alterum; Matth. Valgr. v. 2. 153, but not Camer. Epit. 553, which seems designed for the last.)—Involucre none. Capsules turbinate, rough. Nectaries smooth, with blunt points. Petals heart-shaped.—Native of fields in Germany, France, Italy, and the isle of Cyprus. The stem is branched copiously, from the very bottom. Leaves once or twice three-cleft, usually rather rounder in their whole outline than any of the foregoing. Flowers most like the last, but smaller, with heart-shaped petals, and smooth yellowish nectaries, though the latter are marked with a similar purple stripe, and end in knobbed points. The fruit most resembles that of the second species. The seed is said to be fragrant in this, as well as in *N. sativa*. It is seldom preserved in gardens, though known here before the end of the 17th century.

Section 2. *Styles usually ten.*

5. *N. hispanica*. Spanish Fennel-flower. Linn. Sp. Pl. 753. Curt. Mag. t. 1265. Desfont. Atlant. v. 1. t. 112. (N. hispanica, flore amplo; Ger. em. 1085. Morif. sect. 12. t. 18. f. 9.)—Styles ten, spreading, the length of the petals. Segments of the nectary obtuse.—This splendid species is a native of Spain and Barbary, as well as of the south of France. It has for near 200 years been cultivated, as a hardy annual, in our gardens. The whole plant is larger in all its parts than any we have already described; the stem bushy, and segments of the leaves linear-lanceolate. Flowers large, of a rich purplish blue, varying to a pale red, with dark or reddish stamens and styles. The number of the latter is, we believe, constantly ten. The petals are ovate, an inch long, veiny, pale and greenish underneath. Lower lip of the nectaries hairy, variegated with crimson, in two divaricated, blunt, or somewhat knobbed, lobes.

6. *N. orientalis*. Yellow Fennel-flower. Linn. Sp. Pl. 753. Curt. Mag. t. 1264. (N. pistillis denis, corollæ longioribus; Mill. Ic. 125. t. 187. f. 1. N. chalepensis lutea, corniculis longioribus; Morif. sect. 12. t. 18. f. 10.)—Styles usually ten, nearly erect, twice the length of the petals. Segments of the nectary acute. Seeds compressed, bordered.—Native of Syria. The seeds were sent from Aleppo, at the end of the 17th century. This is a hardy annual, but being less striking in appearance than the last, is not so commonly cultivated. In the gardens of Italy we have often observed it, sometimes with only five styles. The stem is much branched. Leaves narrow. Petals spatulate, acute, about half an inch long, yellow marked with green and

and red. *Nectaries* five or more, yellow, with transverse crimson stripes, hairy; the segments of their lip acute. *Capsules* oblong, compressed, combined at their inner edges, about half way up. *Seeds* flattish, furrowed with a membranous border.

NIGELLA, in *Gardening*, comprises plants of the hardy herbaceous flowering annual kind, of which the species cultivated are; the common fennel-flower (*N. damascena*); the small fennel-flower (*N. fativa*); the field fennel-flower (*N. arvensis*); the Spanish fennel-flower (*N. hispanica*); and the yellow fennel-flower (*N. orientalis*).

The first species from the fine cut leaves about the flower, has the names of *Fennel-flower*, *Devil-in-a-bush*, and *Love-in-a-mist*; but the first is become obsolete.

And there is a variety of it with single white flowers, and another with double flowers, which is frequently cultivated in gardens with other annuals for ornament.

Of the third there is a variety with white flowers, and another with double flowers.

And the fourth has likewise a variety with double flowers.

Method of Culture—These plants are all increased by sowing the seeds on light earth where the plants are to remain, as they seldom succeed well when transplanted, in patches at proper distances; and when the plants are come up, they should be thinned, leaving only three or four in each patch, keeping them afterwards clear from weeds. The best season for sowing is March; but if some be sown in August, soon after they become ripe, on a dry soil, and in a warm situation, they will abide the winter, and flower strong the succeeding year. By sowing the seeds at different times, they may be continued in beauty most part of the summer season. As they are all annual plants they require to be raised every year.

But the varieties with double flowers are chiefly introduced into flower gardens.

They afford ornament and variety among other annuals in the clumps and borders of gardens and pleasure grounds.

NIGELN, in *Geography*, a town of Prussia, in the province of Samland, on the Curisch Nerung; 15 miles S. of Memel.

NIGEMOW, a town of Poland, in Galicia; 14 miles E.S.E. of Halicz.

NIGER, **C. PISCENNIUS**, in *Biography*, a distinguished competitor for the Roman empire, descended from an equestrian family, settled at Aquinum, was brought up to the military service, and passed through different degrees of rank, in such a manner as to procure the notice and esteem of the emperor Marcus Aurelius. Under Commodus he signalized himself in a war with the barbarians in the vicinity of the Danube, and from his conduct when serving against some revolters in Gaul, he was recommended to the emperor, by Septimius Severus, as a man necessary to the state. He was afterwards raised to the consulate at the particular request of the troops serving under him, and he was in possession of the important government of Syria, at the time of the death of Commodus, A.D. 192. The most ample testimony is given by historians to his excellence as a military commander. He punished theft with the utmost rigour. To every thing like luxury and effeminacy in his troops he was a declared foe. He rendered every privation and suffering tolerable to his soldiers by protecting them against the exactions and injustice of their officers, and also by the example which he himself gave of submission to all rules of discipline which he had laid down. Nothing could be more abstemious and hardy than his manner of living in the field, and he could boldly appeal to his assembled army whether he was ever distinguished from those who served in the ranks, except by the mere cir-

cumstance of command. He was not merely a soldier, but had thought maturely on subjects of civil administration, concerning which he would offer advice to the emperors under whom he served. Such was the character of Niger, and so highly was he esteemed by the senate and people, respected by the troops, and beloved by the province which he had governed with mildness and equity, that he ventured to declare himself a candidate for the empire, in the year 193, when the office of chief magistrate had been purchased by Didius Julianus. The army readily concurred in the design, and in conjunction with the citizens of Antioch, near which capital he then lay, saluted him emperor with loud acclamations. All the eastern provinces recognized his elevation, and the surrounding satraps sent their congratulations. He received offers of assistance from the kings and governors in alliance with the empire; but he declined all foreign aid, in the confidence that he should meet with sufficient support from the subjects of Rome. This confidence proved his ruin. A formidable competitor declared himself; this was Septimius Severus, who was at the head of the legions in Illyria, and who possessed all the vigour and policy requisite for a contest. Severus attacked the army of Niger under the command of Æmilianus, and entirely defeated it; after this, the conqueror attacked the emperor himself, and in an obstinate conflict, drove Niger from the field, who, with a few of his friends, fled for safety beyond mount Taurus. He had, previously to this, fortified with great care the passes of this ridge between Cappadocia and Cilicia, and leaving them under a strong guard, he went to Antioch to levy new forces. A violent storm, attended with torrents of rain, overthrew the barriers raised on Taurus, and the enemy penetrated into Cilicia. Niger again faced them near the Issus, on the very spot in which Alexander gained a celebrated victory over Darius. He was again defeated with the loss of 20,000 men, and fled from the field to Antioch, which he found full of consternation. Without stopping, he continued his flight, intending to take refuge among the Parthians, but being overtaken by the enemy's cavalry, he was killed before he could reach the Euphrates. This happened in the beginning of the year 195. The sanguinary victor took vengeance upon his wife and children, whom he caused to be massacred, together with all that bore the name of the unfortunate emperor. Univer. Hist.

NIGER, in *Geography*, a river of Africa, described by the Moors under the name of "Nel, or Neel, el Abeed," or the river of slaves, and "Neel Kibbeer," and called by the Negroes "Joliba," or the Great Waters, known in the country by the name of "Guin," or "Jin," which takes its rise at a small village denominated Sankari, in the high lands of Jallonkoodoo, about six days' journey S.W. from Bammakoo. From this most elevated point in the western quarter of Africa, between the fifth and ninth degrees of W. longitude, the Niger and Gambia turn, in opposite directions, to the east and west. Few geographical facts have been more questioned in modern times than the course of the great inland river of Africa, generally understood by the name of Niger; some describing it to run to the west, and others to the east. The authority of Mr. Park, the African traveller, whose fate has been much regretted, founded on ocular demonstration, sets this question for ever at rest, by determining the course of the river to be from west to east, an opinion which had been anticipated by the information of another traveller, Mr. Houghton, Herodotus, more than twenty-two centuries ago, describes, from the information of the Africans, a great river of Africa, far removed to the south of the Great Desert, and abounding with crocodiles. From him we learn, that it flowed from west to east,

east, dividing Africa, in like manner as Europe is divided by the Danube. This ancient author farther asserts, that the people from the borders of the Mediterranean, who made the discovery, were carried to a great city on the banks of this river; and that the people of this quarter were *black*, that is, much blacker than their visitors. Although Herodotus erroneously supposed this river to be the remote branch of the Egyptian Nile, and reasons on this circumstance accordingly; this argument serves to express, in a more forcible manner, the supposed direction of its course. Pliny also believed that the Nile came from the west; but he is far from identifying it with the Niger, which he describes as a distinct river, and he seems to afford us a probable conclusion respecting its course, for he speaks of the "Bembotus" river as running into the Western ocean, meaning to express by it either the Gambia or Senegal river, and not the Niger. Ptolemy is positive in describing the Niger as a separate stream from the Senegal and Gambia; and his Niger is made to extend from west to east, over half the breadth of Africa, between the Atlantic ocean, and the course of the Nile. It is not certain who started the opposite opinion respecting the course of this river. Edrifi, however, in the 12th century, not only conducted the "Nile of the Negroes," or Niger, *westward*, and into the Atlantic, but also derived it from the Egyptian Nile, in direct contradiction to the opinion of Herodotus. Abulfeda followed Edrifi in the same erroneous opinion respecting the Niger; which he calls a *twin* river with that of Egypt, and also the Nile of Ghana. The sentiments of the moderns seem to have been chiefly adopted in deference to the authority of Edrifi. Accordingly, the early Portuguese discoverers adopted the same idea, and having deduced their knowledge of the African geography from Arabian authors, afterwards set the fashion in what related to this branch of geography. So that in despite of Ptolemy, and of the ancients in general, the great inland river of Africa was described to run to the west, and to form the head of the Senegal river: nay more, it was at last supposed to be the parent stock of all the great *western* rivers of Africa. The ancient and true opinion with regard to the Niger has been revived, and in some measure established by the researches conducted under the African association: in consequence of these, and the subsequent reports of major Houghton and of Mr. Magra, the general position of the sources of the Joliba, or Niger, have been referred to the country of Manding or its vicinity. Bammakoo has been placed near the highest navigable point of its course; Sego and Jenné have been represented as situated near its banks, and its waters as separated into two channels, in the quarter of Tombuctoo. Mr. Park's observations have established these positions, and the conclusion deduced from them. The Niger, from the place of its first rise, appears to run near 100 miles in a northerly course, before it turns finally to the eastward, and its course is such as to intercept all the streams that descend from the Kong mountains on the south. At the lowest point to which Mr. Park traced this river, and which (although about 420 British miles in direct distance from its source) could only be reckoned the early part of its course, it was a very considerable body of water; the largest, he says, which he had seen (in Africa), and it abounded with crocodiles. The rainy season was but just begun; and the river might have been forded at Sego, where its bed expands to a vast breadth. Still, however, says major Rennell, we must not estimate the bulk of the Niger, that Niger which was in contemplation of Pliny and the Romans, by the measure of its bulk at Sego and Silla. If we suppose it to be the same river which passes by Kassina, and we know of no

other, which place is 700 miles, or more, to the eastward of Silla, it would doubtless receive by the way great additional supplies of water, and be at least a much deeper river than where Mr. Park saw it. To Pliny it was well known, that the Niger swelled periodically, like the Nile, and at the same season; and this fact is also proved by Mr. Houghton's report and by Mr. Park's observations. Pliny also says, that its productions were the same with those of the Nile.

The Niger descends from the high level of Manding into Bambarra, on the eastward, with a rapid and furious course, at Bammakoo, about 150 miles below its source; after which it glides smoothly along, and affords an uninterrupted navigation to Houssa, and probably by Kassina to Wangara; by the two first of which places, a very large and navigable stream does certainly pass, under the same name as is applied by the Arabs and Moors to the Joliba, that is, Neel Abeed, or river of slaves; a name that marks the idea of the people of the country through which it flows, in the minds of that people.

The course of the Niger, or Joliba, is established, by ocular demonstration, as far as Silla; and may also be admitted as far as Houssa, about 400 miles farther to the east, on the foundation of the information collected by Mr. Park, with which the reports of Mr. Magra and major Houghton agree. Thus, the first 700 geographical miles of its course are from *west* to *east*, or rather from W.S.W. to E.N.E. It appears from various authorities, that the waters of the Niger are continued from Manding to Wangara: as far as Silla its course is to the eastward, and, without doubt, continues in the same direction to Houssa, 400 miles farther to the eastward, if we may depend upon Mr. Park's information. Other testimonies are also decidedly in favour of an easterly course of the Niger from Houssa to Wangara. The only remaining question pertains to its termination. Many circumstances concur to prove that the Joliba or Niger terminates in lakes in the eastern quarter of Africa; and those lakes seem to be situated in *Wangara* and *Ghana*; which see respectively. That it does not form the *upper part* of the Egyptian Nile, may be inferred from two circumstances; first, the great difference of level that must necessarily exist between the Niger and the Nile, admitting that the Niger reached the country of Abyssinia. For by that time it would have ran at least 2300 geographical miles, in a direct line; and near 2000 after it had descended to the level of the Sahara, or Great Desert. And the Nile, at the point where the White river, (which alone can be taken for the Niger, if the above supposition be admitted,) falls in, has more than a thousand such miles to run before it reaches the sea; and has, moreover, two or more cataraacts to descend in its way: not to add here, that Abyssinia is a very elevated tract. The second circumstance is, that the Niger, throughout the tract of Nigritia, in common with all the rivers of that region, swells with the periodical rains, and is at its highest pitch, when the Nile is under the like circumstances in Egypt. Now, considering how long a time it would require for the waters of Nigritia to reach Egypt, the effect ought surely to be, that instead of what happens at present, the Nile ought to be kept up to nearly its highest pitch, a very long time after the Niger. But without farther enlarging, it is certain, that if the eastern waters do not run into the Nile, (of which there does not appear a shadow of probability,) they must either be evaporated in lakes, or lost in sands. The lake of Kauga offers itself in a position very convenient for the purpose, and a river taken by Edrifi for the Niger, is actually said to pass near it. Moreover, Agathemerus and Ptolemy concur in describing the rivers of interior Africa as terminating as well as be-

ginning

ginning within the continent. Among the eastern waters, the "Gir" of Ptolemy seems to be recognized in the river of Bornou, and its adjuncts; and the Niger in that of Tombuctoo and Wangara. The Panagra of the same geographer answers to Wangara; and his Libya Palus, which forms the termination of the Niger eastward, seems to be meant either for the largest of the lakes, or for the lakes of that country, of which there are several, collectively. Rennell's Proceedings of the African Association, passim. See GUIN and JOLIBA.

NIGHT, that part of the natural day, during which the sun is underneath the horizon: or, night is that space of time wherein the sun is out of our hemisphere.

Under the equator, the nights are always equal to the days. Under the poles, the night continues half a year.

The ancient Gauls and Germans divided their time not by days, but nights; as appears from Tacitus and Cæsar; and the people of Iceland and the Arabs do the same at this day. See DAY, HOUR, &c.

The same is also observed of our Saxon ancestors.

Thus in the council of Cloveshoe, anno 824, we read, "Ibi finita et proscripta contentione coram episcopo post 30 noctes, illum juramentum ad Westmister deductum est."—Whence our custom of saying, *sevenight*, *fortnight*, &c.

NIGHT, *Signals by*. See SIGNALS.

NIGHT-awn-hynd, *Third*. See THIRD.

NIGHT-mare. See INCUBUS.

We shall here observe that the term "night-mare" is derived from *Mara*, which in the Runic theology of the ancient Scandinavians, was a spirit or spectre of the night, that seized men in their sleep, and suddenly deprived them of speech and motion. See Keyser, *Antiquit. Sel. Septentrional*, cited by Warton, in his *Hist. of Eng. Poetry*, vol. i. diff. 1.

NIGHT-HAWK, in *Ornithology*. See CAPRIMULGUS *Europæus*.

NIGHTINGALE, *Luscinia* or *Philomela*, the brownish-grey motacilla, with the annules of the knees grey. See MOTACILLA *Luscinia*.

The nightingale derives its name from *night*, and the Saxon word *galan*, to sing.

Mr. Hunter found, by dissection, that the muscles of the larynx are stronger in the nightingale than in any other bird of the same size.

This bird, the most famed of the feathered tribe, for the variety, length, and sweetness of its notes, visits England in April or May, and leaves us in August; and during its continuance with us, its range is confined to a part of this island: it is not found in Scotland, Ireland, or North Wales, nor in any of the northern countries, except Yorkshire; and it does not migrate so far to the west as Devonshire and Cornwall. Nightingales form their nests of oak leaves, a few bents, and reeds. The eggs are of a deep brown. They begin their song in the evening, and continue it the whole night. Pennant.

NIGHTINGALE, *American*, of Edwards. See MOTACILLA *Calidris*.

NIGHTINGALE, *Mock*, or *Black-cap*. See MOTACILLA *Atricapilla*.

NIGHTINGALE, *Virginian*, the common, but improper name of a bird of the gros-beaked kind, called by authors the *coccothraustes indica cristata*: it is brought to us from Virginia, and is much valued in England for its beauty and delicate manner of singing; it is very fond of almonds and the like fruits. See LOXIA *Cardinalis*.

NIGHTINGALE *Island*, in *Geography*, a small island in the East Indian sea, near the S. coast of Madura. S. lat. 7°

15'. E. long. 114°.—Also, a small island in the South Atlantic ocean, of an irregular form, with a hollow in the centre, about seven or eight miles in circumference. At its southern extremity are some rocky islets, and on the N.E. coast is anchorage. S. lat. 37° 29'. W. long. 11° 48'.

NIGHTSHADE, in *Botany*. See SOLANUM.

NIGHTSHADE, *Garden*, *Solanum nigrum*, in the *Materia Medica*, is common about rubbishy dunghills, and in neglected gardens, producing its flowers during all the summer months. Its smell is faint and disagreeable; but, being simply herbaceous, it manifests no peculiar flavour to the taste. It appears to possess the deleterious qualities of the other nightshades, in a very considerable degree; its odour being, as it is said, so powerfully narcotic as to cause sleep. The berries are equally poisonous with the leaves. Three children, upon eating them, were suddenly seized with cardialgia and delirium, accompanied with spasms, and remarkable distortions of the limbs; and to poultry they proved fatal in a short time. The plant, or rather the leaves, which were boiled and eaten by a mother and four children, produced swellings of the face and limbs, followed by inflammation and gangrene; but the husband, who likewise ate of this vegetable at the same time, found no consequent disorder. Its deleterious effects appear still more certain from the experiments of Messrs. Gataker and Bromfield; the latter asserting that in doses of one grain it had a mortal effect upon one of his patients. However, Dioscorides and Theophrastus mention it as an esculent plant, and Guerin, cited by Woodville, relates, that he drank an infusion of fifteen grains of the *Solanum nigrum* without suffering, in consequence of it, any complaint: and that an epileptic patient took from half a dram to two drams of the expressed juice of the plant, without perceiving any narcotic symptoms; nor with some soldiers, to whom a still larger dose was given, together with two drams of the juice of the berries, was any other effect produced, than that of an increased quantity of urine. As this species of nightshade is supposed to be the *Εγεχυρος κηπαιος* of Dioscorides, its external use was resorted to in ancient times as a discutient and anodyne in various affections of the skin, tumefactions of the glands, ulcers, and disorders of the eyes; nor does the utility of this practice want the confirmation of later experience. With the Arabians it is a common application to burns and ulcers; and Ray also expresses a high opinion of its effects in indurations of the breast. The writings of the ancients afford little evidence of its internal use; though, according to Cæsalpinus, it appears not to have been wholly neglected. The attention of the faculty was directed to this plant in the year 1757, by Mr. Gataker, surgeon to the Westminster hospital, by a publication recommending its internal use in old sores, scrofulous and cancerous ulcers, cutaneous eruptions, and even in dropsies; all of which were much relieved, or completely cured, by the solanum. From his experiments it appears, that one grain of the dried leaves of the plant, infused in an ounce of water, sometimes produced a considerable effect; that in the dose of two or three grains it seldom failed to evacuate the first passages, or to increase very sensibly either the discharge by the skin, or that by the kidneys, and it not unfrequently occasioned headache, giddiness, dimness, and drowsiness. Mr. Bromfield, who soon afterwards published a pamphlet on the same subject, declares, that the cases in which he tried the solanum were much aggravated by it, and he therefore contends that the use of it is prejudicial and dangerous. Judging from the disuse of the solanum, since the termination of this controversy, the opinion of Mr. Bromfield seems to be tacitly confirmed.

firmed. Afterwards, viz. in 1764, Mr. Gataker ascribed the efficacy of nightshade, not to any specific power, but to the evacuation produced by it. Lewis. Murray. Woodville.

NIGHTSHADE, *American*, in *Botany*, &c. See PHYTO-LACCA.

NIGHTSHADE, *Bastard*. See RIVINA.

NIGHTSHADE, *Deadly*. See ATROPA.

NIGHTSHADE, *Deadly*, in the *Materia Medica*. (See ATROPA.) Sauvages (Nofol.) supposes that the belladonna was the plant which produced such strange and dreadful effects upon the Roman soldiers, during their retreat, under the command of Antony, from the Parthians: they are said by Plutarch to have suffered great distress for want of provisions, and were urged to eat unknown plants; among others, they met with an herb that was mortal; he that had eaten of it lost his memory and his senses, and employed himself wholly in turning about all the stones he could find, and, after vomiting up bile, fell down dead. Shakspeare in his Macbeth makes Banquo say,

“ Or have we eaten of the insane root
That takes the reason prisoner.”

There is a remarkable instance of the direful effects of this plant recorded in Buchanan's History of Scotland; wherein he gives an account of the destruction of the army of Sweno, when he invaded Scotland, by mixing a quantity of the juice of these berries with the drink which the Scots, by their truce, were to supply them with: this so intoxicated the Danes, that the Scots fell upon them, in their sleep, and killed the greatest part of them; so that there were scarcely men enough left to carry off their king. See on this article, Phil. Transf. vol. lx. part i. p. 62.

NIGHTSHADE, *Enchanter's*, in *Botany*. See CIRCÆA.

NIGHTSHADE, *Malabar*. See BASELLA.

NIGHTSHADE, *Three-leaved*, or Herb Puris of Canada. See TRILLIUM.

NIGHTSHADE, *Woody*, called *Bitter-sweet*. See SOLANUM Dulcamara.

NIGHTSHADE, *Woody*, *Dulcamara*, in the *Materia Medica*, is a plant which grows plentifully by the side of hedges and in moist ditches, climbing upon the bushes, with winding, woody, but brittle stalks. It is perennial, and flowers in June and July. The roots and stalks of this species; which, on first chewing them, yield a considerable bitterness, that is soon followed by an almost honey-like sweetness, have been commended in different disorders, as high resolvents and deobstruents.

Experience, says Dr. Lewis, has shewn that they are by no means equally deleterious with deadly nightshade; that they act more regularly and uniformly; and that, without producing nervous complaints, they produce more considerable evacuations, especially by stool: but, he adds, that their virtues, in particular cases, have not yet been sufficiently ascertained. The younger branches, on extreme twigs, either fresh or dried, in which latter case their powers are somewhat diminished, are the parts employed; and their sensible qualities are said to be the strongest in Autumn, when the leaves are fallen; and, therefore, they should be gathered at this season rather than in spring. Boiling water extracts their whole active matter; but their virtues are destroyed by much motion. Scheele found that they contain citric acid. Dulcamara is very generally admitted to be a medicine of very considerable efficacy. Murray says, that it promotes all the secretions; Haller observes, that it partakes of the milder powers of the nightshade, joined to a resolvent and saponaceous quality; and the opinion of Ber-

gius seems to coincide with that of Murray. This author confines its uses to rheumatismus, retentio mensium et lochiorum. It appears also, by the experiments of Razoux, and others, to have been used with advantage in some obstinate cutaneous affections. Dr. Cullen says, that he has employed a decoction of the slender twigs in the cure of rheumatism, sometimes with advantage, but at other times without any effect: he adds, that the dulcamara, in all his trials, has hardly ever been observed to be in any measure diuretic. Of the various diseases in which it has been recommended, the chief instances enumerated by Haller and Murray are, phthisis, lues venerea, peripneumonia notha, scorbutus, icterus, asthma, &c. on the authority of Boerhaave, Sauvages, Sager, and others. Mr. Thomson, in his “London Dispensatory,” says, that it has been found useful in humoral asthma, dropsy, chronic rheumatism, and in lepra vulgaris and alphas, pfora, and pyriasis. Willan says, that it is not applicable for the cure of lepra nigricans, and Mr. Thomson asserts, that it is not of the least use in acute rheumatism, nor, as he conceives, in fluor albus and suppression of the menses, in which cases it has been strongly recommended. This plant is generally given in decoction or infusion, and sometimes in the substance pulverized; and to prevent its exciting nausea, it is ordered to be diluted with milk, and to begin with small doses, as large doses have been found to produce very dangerous symptoms, such as vomiting, convulsions, and delirium, violent palpitation, and a palsy of the tongue. Razoux gives the following prescription; R Stipitum dulcam. rec. drac. fl. in aquæ font unc. 16 coquatur ad unc. 8. This was taken in the dose of three or four drams, diluted with an equal quantity of milk every four hours. Linnæus directs two drams or half an ounce of the dried stipites to be infused half an hour in boiling water, and then to be boiled ten minutes; and of this decoction he gave two tea-cups full morning and evening. In the London Pharmacopeia the decoction is directed to be prepared by boiling down one ounce of the stalks sliced in one and a half pint of water to a pint and straining. The dose is from f3iv. to f3j, combined with any aromatic tincture, given thrice a day. The extract of belladonna is prepared by bruising a pound of the fresh leaves in a stone-mortar, sprinkling over them a little water; then expressing the juice, and, without any separation of the sediment, evaporating it to a proper consistence. The inspissated juice of the Edinburgh Pharmacopeia is prepared by bruising the fresh leaves, inclosing them in a hempen bag, and pressing them strongly, until they yield their juice, which is to be evaporated in flat vessels, heated with boiling water saturated with muriate of soda (common salt), and immediately reducing to the consistence of thick honey: and when the mass is cold putting it into glazed earthen vessels, and moistening with alcohol. The medicinal properties of this extract are the same as those of the plant, but weaker. The dose is from gr. j. gradually increased to grs. v., given in the form of pills. The dose of the powder may be from grs. x. to 3i, taken in a cupful of milk. The berries have not yet been applied to medical use. They ripen in September and October; they are very juicy, bitter, and poisonous. As they are very common in the hedges, and may be easily mistaken by children for red currants, which they somewhat resemble, their deleterious effects are the more worthy of notice. Lewis. Mat. Med. Woodv. Med. Bot.

NIGHTWALKERS, in a *legal* sense, are such persons as sleep by day and walk by night, being oftentimes pilferers or disturbers of the peace.

5 Ed. III. cap. 14. Constables are authorised by the common

mon law to arrest nightwalkers, and suspicious persons, &c. Watchmen may also arrest nightwalkers, and hold them until morning: and, it is said, that a private person may arrest any suspicious nightwalker, and detain him till he give a good account of himself. (2 Hal. P.C. 98.) One may be bound to the good behaviour for being a nightwalker; and common nightwalkers and haunters of bawdy-houses are to be indicted before justices of peace, &c. But it is held not lawful for constable, &c. to take up any woman, as a nightwalker, on bare suspicion only of being of ill fame, unless she be guilty of a breach of the peace, or some other unlawful act.

NIGHTWALKERS, in a *physical* sense. See NOCTAMBULATIO.

NIGIDIUS FIGULUS, PUBLIUS, in *Biography*, one of the most learned men of ancient Rome, the contemporary and friend of Cicero, was a professed advocate for the doctrines advanced and defined by Pythagoras. He is represented by Cicero as an accurate and penetrating enquirer into nature, and as one to whom is to be ascribed the revival of that philosophy which had formerly flourished for several ages in the Pythagorean schools, both in Italy and Sicily. He was also a considerable proficient in mathematical and astronomical learning, but like his master applied the knowledge of nature to the purposes of imposture. He held frequent disputations with Cicero and his friends on philosophical subjects. His attachment to science did not prevent him from engaging in civil affairs, and aspiring to posts of honour and authority in the state. Cicero was indebted to him for considerable assistance in unravelling and defeating Cataline's conspiracy, and he also received important services from him in the time of his adversity. Nigidius, in the civil war between Pompey and Cæsar, attached himself to the party of the former, and upon Cæsar's accession to the supreme power, he was banished from Rome, and died in a state of exile. He wrote several books on various subjects, of which fragments only have come to our hands, which may be seen in the "Varie Lectiones" of Janus Rutgers; and in the "Comment. de Hist." by Anthony Riccoboni. After the time of Nigidius the Pythagorean doctrine was much neglected, few persons being able to decypher, with accuracy, the obscure dogmas of this mysterious sect. Enfield's Hist. of Phil. vol. ii. Univer. Hist.

NIGLARIEN, in *Greek Music*, the name of a languid and effeminate note or chant, with which Aristophanes reproaches its author, Philoxenes.

NIGONO, in *Geography*, a town of Italy, in the department of the Panaro; 22 miles S.W. of Modena.

NIGRINA, in *Botany*, a name alluding to the universal blackness assumed by the plants in drying, has been applied by Thunberg to two very different things, the MELASMA of Bergius, and the CHLORANTHUS of Swartz; see those articles.

NIGRITIA, in *Geography*. See NEGROLAND.

NIGRITIES OSSIUM, among the ancients. See CARRIES.

NIGUMBO, in *Geography*. See NEGOMBO.

NIHIL, NIHILUM, *Nothing*, among the school philosophers, is what has no real esse, and which is only conceived negatively, and denominated by a negative.

NIHIL Capiat per Billam, or per breve, in *Law*, is a form used, when judgment is given against the plaintiff, so as to bar his action, or overthrow his writ or bill.

NIHIL, or Nil debet, is the usual plea in an action of debt; but it is no plea in an action of covenant, or breach assigned for non-payment of rent, &c.

NIHIL Dicit is a failing of a defendant to put in an answer

to the plaintiff's plea by the day assigned; on which omission judgment is given against him of course, *quod nihil dicit*, because he alleges nothing to the contrary.

NIHIL, or *Nihili album*, in *Botany*. See POMPHOLYX.

NIHILS, or NICHILS, in *Law*, issues which the sheriff, that is apposed in the exchequer, says are nothing worth, and ill-venable; from the insufficiency of the parties that should pay them.

NIHILS, *Clerk of the, nihilorum clericus*. See CLERK and EXCHEQUER.

NIJAR, in *Geography*, a town of Spain, in the province of Granada; 12 miles N.E. of Almeria.

NIKA, a town of Persia, in Mazanderan; 15 miles S.E. of Fehrabad.

NIKALINZIN, a town of Poland, in Galicia; 44 miles S. of Halicz.

NIKERA, a river of Guiana, which runs into the Atlantic, N. lat. 6°. W. long. 57° 20'.

NIKIA, a town of European Turkey, in Macedonia; 26 miles S.E. of Akrida.

NIKIOPING, or NYKOPING, *i. e. New Mart*, a seaport of Sweden, and capital of Sudermanland, situated at the mouth of a river, near the Baltic. The town is well built, and is one of the most ancient cities in Sweden, having formerly been the residence of the kings and princes of Sudermanland. Its air is so mild and salubrious, that the court and its attendants have removed hither from Stockholm in a time of contagion. The number of its inhabitants exceeds 12,000; and the city is nearly bisected by a large river, over which a stone bridge was erected in 1728. This town, which has suffered much by fire, the ravages of the Russians, and the decays of time, has two handsome churches, a commodious harbour, several manufactories of cloth and Morocco leather, a brass hammer-mill, and carries on a considerable trade by sea. Its chief magistrates are two burgo-masters. The governor of Sudermanland resides in this city. The Swedish language is supposed to be spoken in its greatest purity at Nikioping and its vicinity. Without this town is a royal enclosure, and the adjacent country is very fertile; 50 miles S.W. of Stockholm. N. lat. 58° 45'. E. long. 16° 53'.

NIKITSK, a town of Russia, in the government of Moscow; 20 miles S.E. of Moscow.

NIKLE', a town of Egypt, on the left branch of the Nile; 10 miles S. of Faoué.

NIK MID, or NICK MID. See ISMID.

NIKOLAEVSKOI, a town of Russia, in the government of Vologda; 36 miles S.E. of Totma.—Also, a town of Russia, in the government of Tobolsk, on the Undeba; 60 miles E.S.E. of Tomsk.—Also, a town of Russia, in the last-named government; 72 miles S.E. of Eniseisk.

NIKOLAI, or NIKOLOW, a town of Silesia, in the lordship of Pleß; 12 miles N. of Pleß. N. lat. 50° 8'. E. long. 18° 50'.

NIKOLAJEV, a town of Russia, in the government of Ekaterinoflav, on the Ingul, near the Bog. This town was founded in 1791, and has since increased so rapidly, that the admiralty has been removed hither from Cherfon; 63 miles N.W. of Cherfon. N. lat. 46° 54'. E. long. 31° 55'.

NIKOLSK, a town of Russia, in the government of Vologda, and province of Usting, on the Jug; six miles S. of Usting. N. lat. 59° 55'. E. long. 45° 34'.

NIKOLSKOI, a town of Russia, in the government of Archangel; 52 miles W.S.W. of Archangel.—Also, a town of Russia, in the government of Archangel, on the Onega; 72 miles S.E. of Onega.—Also, a town of Russia, in the government

government of Archangel; 52 miles S. of Mezen.—Also, a town of Russia, in the government of Vologda; 24 miles S.S.E. of Vologda.—Also, a town of Russia, in the government of Upha, on the Ural; 80 miles E.S.E. of Orenburg.—Also, a town of Russia, in the government of Tobolsk; 40 miles N. of Tomsk.

NIKSAR. See NICSAR.

NIL, in *Botany*, a name given by the Arabians to two very different seeds, which are often, by this means, mistaken in their writings one for another. Avicenna tells us, first, that nil is the seed of a creeping plant, of the bindweed kind, and that this plant had blue flowers, like the campanules, or bell-flowers; but, in another place, he tells us, that nil is the name of a plant used in dyeing, which seems to be the same with our *isatis*, or woad.

It is probable, that the convolvulus, or bindweed, called nil, obtained this name only from its flower being of the same colour with the fine blue pigment obtained from the other nil, or woad.

NIL *habuit in tenementis*, in *Law*, a plea to be brought in an action of debt only, brought by a lessor against a lessee, for years, or at will, without deed.

NILAB, in *Geography*, a name given to the river Indus, or Sinde, in Thibet.

NILACUNDI, in *Natural History*, a name given to a stone of the gem kind, which is half a sapphire and half a ruby.

The word *nilaa* is the Indian name for the sapphire, derived from the word *nil*, the name of indigo, and given to this gem because of its fine blue colour, which approaches to the tinge of the pigment. The latter part of the word is not easily accounted for, without making a little variation in the spelling, but with that, is very clear and easy. *Jacut*, or *jacuti*, and, as some speak it, *jacunti*, is the name given by the Indians to the ruby, and it is only supposing the word to be properly *niljacunti*, and it expresses, in their own language, exactly what we understand by it, a stone part sapphire and part ruby.

NILAHUMATU, in *Botany*, a name given by several authors to the smooth-fruited itronium of Malabar.

NILAS, in *Geography*, a town of Mexico, in the province of Culiacan; 50 miles N.E. of Culiacan.

NIL-CUND, a town of Thibet; 75 miles N. of Catmandu. N. lat. 29° 18'. E. long. 84° 57'.

NILE, a famous river of Africa, which rises in the Gebel-el-Kumr, or mountains of the moon, in a district called *Donga*, (which see,) N. lat. 8°. It is first known by the name of *BAHR el-Abiad*, (which see,) or the White river, and about N. lat. 16° is joined by the *BAHR el-Azrek*, (which see,) or the Blue river; the former tinged, and the latter clear, as is the case with respect to the Maranon and the Missouri; and which after several windings and turnings, and being united with various other streams, enters Egypt at Assuan or Syene. In its course it washes the walls of many cities and towns, and having divided Egypt into two parts, it discharges itself by seven mouths into the Mediterranean, N. lat. 31° 25'. The comparative course of the Nile may be estimated at about 2000 British miles, thus rivalling the longest Asiatic rivers, and being only exceeded by the Ob, Kian-ku, and Hoan ho, and also by the Maranon, and probably by the Missouri. This river forms some considerable cataracts, the chief of which is that of Granadil in Nubia, N. lat. 22°, before it gains the level of Egypt, after passing some rapids to the S. of Syene. Alvarez has long ago observed, that the rise of the Nile in Egypt is occasioned by the violent rains, which, during the

summer, deluge the southern regions; and he might also have added the melting of the snow on the African alps, which give source to the real Nile, or *Bahr-el-Abiad*; for as the Atlas is covered with perpetual snow, which also crowns the Andes under the equator, it is probable, that the central ridge of Africa presents the same features, and that an ancient geographer might have been frozen to death in his torrid zone. Besides, Abyssinia, through which the Abyssinian Nile, or *Bahr-el-Azrek* passes, is one of the most mountainous and precipitous countries in the world. The fertility of Egypt, which is for the greatest part a narrow vale, through which the Nile passes, has been generally ascribed to the inundations of this river; but this is applicable in a strict sense only to parts of the Delta; whereas, in other districts there are canals, and the adjacent lands are generally watered by machines. Mr. Gray's description of Egypt, as immersed under the influx of the Nile, though exquisitely poetical, is far from being just. In Upper Egypt the river is confined by high banks, which prevent any inundation into the adjacent country. This is also the case in Lower Egypt, except at the extremities of the Delta, where the Nile is never more than a few feet below the surface of the ground, and where of course inundation takes place. But the country, as we may imagine, is without habitations. The fertility of Egypt, says Mr. Browne, the intelligent and observing traveller now cited, arises from human art. The lands near the river are watered by machines; and if they extend to any width, canals have been cut. The soil in general is so rich as to require no manure. It is a pure black mould free from stones, and of a very tenacious unctuous nature. When left uncultivated, fissures have been observed, arising from extreme heat, of such depth that a spear of six feet could not reach the bottom. Rain in Egypt is a very uncommon phenomenon; the heat also is extreme, particularly from March to November; and as a supply of water was so desirable, we need not wonder that the usual period of the Nile's inundation should be expected with so much anxiety, and that instruments should be constructed for measuring its increase. (See *NILEMETER*.) Until the summer solstice, this increase is not much perceived, but it continues advancing till near the end of August, and often even in September. The greatest breadth of this majestic river may be computed at 2000 feet, or about one-third of a mile. Its motion is even slower than that of the Thames, and does not exceed three miles an hour. The water is always muddy; in April and May, when it is clearest, it has still a cloudy hue; when it overflows, the colour is a dirty red. It is purified before it is drank; and for this purpose bitter almonds pulverized are mixed in a jar of water, and turned about for some minutes: it is then left to settle, and in five or six hours the heterogeneous particles subside to the bottom of the vessel, and the water becomes limpid and excellent. The Nile abounds with a variety of fish; such as the bûti or labrus niloticus, kelb-el-bahr, farbân, charmût, a round fish about eight inches long, and said to be poisonous, taban-el-bahr, oreel, *i. e.* muræna anguilla, and nesâsh, apparently a species of salmon, and found of a very large size. The oxyrynchus is also famous in the antiquities of Egypt, and according to D'Anville is the fish now called keshee. The best is the bûti, somewhat like the white trout, but sometimes attaining to the weight of fifty pounds. Except good and large eels, none of the fish have a strict similitude of the European. Among several kinds of water-fowl which frequent the Nile, we may mention the large fowl, here called the Turkey goose, or *Anas nilotica*, the flesh of which is palatable and salubrious food. From Cairo to Assuan,

Affouan, about 360 miles, the banks, except where they are rocky, present no natural plant; they somewhat resemble the steps of stairs, and are sown with all sorts of esculent vegetables, chiefly that useful plant the "bamea," which grows to little more than three feet in height, with leaves like those of the currant-bush, and produces oblong aculeated pods, which yield a pleasant flavour to the repast. Other striking and ancient features of this distinguished stream, are the rafts of "belasses," or large white jars, used for carrying water; little rafts of gourds, in which a single person conducts himself with great philosophical dignity across the stream; and the divers who, concealing their heads in pumpkins, approach the water-fowl unperceived, and seize them by the legs. The hippopotamus Mr. Browne never saw or heard of in Egypt; in Nubia they are said to abound. The crocodiles are reduced in number, and are confined to the district above Assiût, where they are dangerous to bathers. It is not easy, we are told, to conceive a more pleasurable mode of travelling than that by the Nile when it overflows. The great body of water, perfectly calm and unruffled, the banks on each side covered with the rich produce of the husbandman's labour, form a scene in every sense alluring. The passengers are protected by a simple awning of branches from the immediate action of the sun, and the great heat of the tropical latitude is allayed by a gentle breeze, which generally continues during four or five meridian hours. The mariners chant responsive to the motion of their oars; and the vessel offers an apt emblem of smiling fortune in her most prosperous career. The narrow vale through which the Nile pursues its course in Egypt, is bounded on either side with barren rocks and mountains. The towns and cultivation are chiefly on the eastern bank; behind which are vast ranges of mountains extending to the Arabian gulf, abounding with marble and porphyry, but almost destitute of water, and inhabited only by Bedouins. Across these mountains is a solitary road to Cosseir on the Red sea. On the west the hills lead to a vast sandy desert, in which are the two Oases, a name applied to islands situated in sand.

The sources of the Nile, and the causes of its inundation and fertilizing powers, have been subjects of speculation and of historical detail from almost the remotest period of antiquity. Our limits forbid our entering on a detail of the different conjectures of ancient writers; especially as we have obtained more satisfactory information with regard to these particulars from modern travellers. Those who wish to acquaint themselves with the opinions of the ancients, may consult Herodotus, Diodorus Siculus, Strabo, and Pliny. (See DELTA, EGYPT, and NILOMETER.) The Nile during the three months of its inundation supplies Egypt, without the aid of rain, with a sufficient quantity of water for the rest of the year; and as it thus facilitates, or rather in a considerable degree supercedes labour, it has been styled the source of plenty and happiness, and even of life itself. If Albuquerque, the Portuguese, had been able to execute his project of turning its course from Ethiopia into the Red sea, this country, which is now so rich, would have become a savage desert, surrounded by solitudes. We need not wonder, therefore, that the Egyptians should always have professed, and that they should still retain a kind of religious veneration for the Nile. They have called it holy, blessed, and sacred: and on the appearance of the new waters, that is, on the opening of the canals, mothers are seen plunging their children into the stream, from a belief that these waters have a purifying and divine virtue, such as the ancients are said to have attributed to every river.

The Nile was reckoned in the number of the great gods of the Egyptians. To this beautiful river they gave the name of Oceanus, Ypecus, and Nilus; and it was also denominated Siris, which, by abbreviation, is the same name with Ofiris, because in reality it represented that god. Of all the festivals they celebrated in honour of this river, that of opening the canals, at the time of its inundation, was the most solemn and magnificent. At this festival the ancient kings of Egypt assisted in person, accompanied by their ministers, by all the grandees of the kingdom, and by an innumerable multitude of people. They anticipated their obligations to this river for the benefits which its inundation was to produce, by throwing into it, in the form of sacrifice, barley, corn, sugar, and other fruits. It is said that on this joyful occasion, they made a sacrifice of a young virgin, whom they drowned in this river. A custom still subsisting at this day, says Savary, seems to prove that the Egyptians formerly sacrificed a young virgin to the god of the Nile; for they now make a statue of earth in the shape of a girl, to which they give the name of "the betrothed bride," upon the dyke of the "Khalig of the Prince of the Faithful," which they throw into the river previously to the opening of the canal. At the festival, when this custom is observed, the pacha descends from the castle, accompanied by his whole court, and repairs in pomp to Fostat, where the canal commences that traverses Grand Cairo. (See CAIRO.) He places himself under a magnificent pavilion, prepared at the head of the dyke. The beys, preceded by their music, and followed by their mamelukes, compose his retinue: the chiefs of their religion appear mounted on horses richly caparisoned. All the inhabitants on horseback, on foot and in boats, are anxious to assist at this ceremony. The land and the water are covered by upwards of 300,000 men. The boats are in general agreeably painted, well carved, and ornamented with canopies and flags of different colours. Those of the women are distinguished by their elegance, their richness, the gilded columns that support the canopy, and above all, by the blinds let down over the windows. Every body remains silent until the moment when the pacha gives the signal. In an instant the air is filled with shouts of joy, the trumpets sound a flourish, and the timbrels and other instruments resound from every side. When the dam is destroyed, and the waters flow towards Grand Cairo, the viceroy throws into the canal pieces of gold and silver, which are picked up by skilful divers. During the amusements of this day the inhabitants seem to be in a state of intoxication. Mutual compliments and congratulations pass, and on every side are heard songs of thanksgiving. A crowd of dancing girls run along the banks of the Khalig, and enliven the spectators by their lascivious dances. The succeeding nights, after the canal has filled the great squares of the capital, afford more agreeable spectacles. In the evening each family is collected in boats, ornamented with carpets and rich cushions; the streets, the mosques, and the minarets are illuminated. The largest square in the city, nearly half a league in circumference, forms an immense basin, surrounded by the palaces of the beys, lighted with lamps of various colours. Several thousand boats with masts, from which lamps are suspended, produce a moving illumination, the aspects of which are continually varying. The coolness of the night, the serenity of the sky, and various other circumstances, concur to render the scene interesting and delightful. The Egyptians, according to Maximus Tyrius, worshipped the Nile on account of its usefulness.

NILEMBI NEUR, a town of the island of Ceylon, in the dominions of Candy, about six or seven miles S. of Candy; whither

whither the king occasionally retreats, and where he has a palace and store-houses.

NILIACUM MEL, a name by which the ancients expressed the very finest honey.

NILOMETER, or NILOSCOPE, an instrument used among the ancients to measure the height of the water of the river Nile, in its overflowings.

This word comes from Νίλος, *Nile* (and that from νεῖλος, *new mud*, or, as some others will have it, from νέω, *I flow*, and ἵλος, *mud*), and μέτρον, *measure*. The Greeks more ordinarily call it Νειλοσκοπίον. It is called by the Arabians *Mekias*, denoting measure.

The nilometer is said by several Arabian writers to have been first set up, for this purpose, by Joseph, during his regency in Egypt: the measure of it was sixteen cubits, this being the height of the increase of the Nile, which was necessary to the fruitfulness of Egypt.

From the measure of this column, Dr. Cumberland deduces an argument, in order to prove that the Jewish and Egyptian cubit were of the same length. *Scripture Weights and Measures*, p. 18.

In the time of Herodotus 16, or at least 15 cubits were necessary to overflow the *Delta* (which see): the same number of cubits was the standard measure in the time of the Romans. Before the time of Petronius, as we learn from Strabo, plenty was not known in the Delta unless the Nile rose to 14 cubits. A book in Arabic still exists, entitled "Nil si alnel al Nil," which contains a table of all the risings of the Nile from the first year of the Hegira (A. D. 622), down to the year 875 (A. D. 1470); and this work ascertains that in the latest times, as often as the Nile has 14 cubits depth in its channel, there is a harvest sufficient for the year; that, if it reaches 16, there is sufficient for two years; but when it falls short of 14, or exceeds 18, famine ensues, and this account corresponds exactly with that of Herodotus. The contents of this Arabic book may be known by those who consult the word *Nile* in the *Bibliothèque Orientale* of D'Herbelot, or the extracts from *Kalkafendas*, in Dr. Shaw's *Travels*. M. Volney observes, that the measure of these cubits is not uncertain. Fréret, D'Anville, and M. Bailli, have proved, that the Egyptian cubit, being invariably 24 digits, is equal to $20\frac{1}{2}$ French inches, and the present cubit, called "Draa Mafri," is precisely divided into 24 digits, and contains $20\frac{1}{2}$ French inches. But the columns by which the rise of the Nile is measured have undergone an alteration. Until the time of Omar, the measuring column, called the nilometer, had been divided into cubits of 24 digits each; but in order to remedy certain irregularities, which had been found very disadvantageous to commerce, he ordered this nilometer to be destroyed, and substituting another in its place, which he erected in the island of Raouda, he commanded that the 12 lower cubits should consist of 28 digits instead of 24, while the upper remained the same as before: hence, when the rise of the Nile appeared by the column to be 12 cubits, it was really 14; for these 12 cubits being each of them four digits too long, there was an excess of 48 digits, or two cubits. Consequently, when 14 cubits, the measure of a sufficient harvest, were proclaimed, the inundation was really at the height for plenty, and the multitude, always deceived by words, never suspected the imposition. But this alteration could not escape the Arabian historians, who tell us, that the columns of the Saide, or Upper Egypt, continued to be divided by 24 digits; that the height of 18 cubits (according to the old reckoning) was always injurious; and that 19 was very rare, and al-

most a prodigy. Nothing, therefore, is less certain than the progressive changes here alleged; and which are rendered improbable by a known fact, which is, that in the long period of 18 centuries the rise of the Nile never varied. Whence then is the present difference? How can it so soon have altered from 15 to 22 cubits, since the year 1473? This is owing, as Volney apprehends, not to physical changes, but to other circumstances. It is not the Nile, but the column and measures which have varied. Of this fact Pocock and Niebuhr have given sufficient evidence. If we advert to the account of Herodotus, he says that according to the report of the Egyptian priests the Nile inundated the Delta, in the time of Mæris, if it only rose to eight cubits. In order to solve this difficulty, it should be considered, that subsequent to this prince, an alteration took place in the measure of the country, and one cubit was made into two. It will be proper likewise to observe, that the degrees of inundation are not the same through all Egypt, on the contrary, a gradual diminution takes place as the river approaches the sea. At Assouan or Syene the overflow is more considerable by one-sixth than at Grand Cairo; and when the depth of water, at this latter city, is 27 feet, it is scarcely four at Rosetta and Damietta. The reason of this is, that besides the quantity of water absorbed by the grounds, as it flows, the river, confined in one single bed, and within a narrow valley, rises higher in the upper country; whereas, when it has passed Cairo, being no longer obstructed by the mountains, and separating into a great number of branches, it necessarily loses in depth what it acquires in surface. Volney's *Travels*, vol. i.

Herodotus mentions a column erected in a point of the island of Delta, to serve as a Nilometer: and there is still one of the same kind in a mosque of the same place.

The Nilometer at the point of the isle of Raouda is thus described by Savary. It is a lofty pillar of marble in the middle of a basin, the bottom of which is on a level with the bed of the Nile. It is graduated through its whole length, and divided into cubits and inches. A Corinthian capital, on which rests a beam, that supports a gallery, crowns this column. When the inundation commences, the waters enter the basin by a conduit; the public cryers then examine the pillar every morning, and publish the daily increase of the river in all the streets of Cairo. When it reaches 16 cubits, the dyke, which closes the canal of the "Prince of the Faithful," is cut with great ceremony; and the Nile flows across the town, amidst the acclamations of the people, who make the cryers a small acknowledgment. As Egypt owes no tribute to the grand seignior when the waters do not rise to 16 cubits, they often conceal the truth, and do not publish their attainment of a certain point, even when they have passed it. See NILE.

Before the Arabian conquest of Egypt, the Nilometer was placed in the town of "Halouan," five leagues to the southward of Fostat, opposite to the ancient Memphis, which, at the time of this conquest, was the residence of the governors of Egypt. In the year 92 of the Hegira, this mekias was overturned, and the caliph ordered another to be erected in the island between Fostat and Gizé. One hundred and forty years after, this Nilometer fell, and the emperor Elmetouakkel built another in the same place, which was called the "New Mekias." This Nilometer is now existing.

As all the riches of Egypt arise from the inundations of the Nile, the Egyptians used to supplicate them at the hands of their Serapis; and committed the most execrable crimes, as actions forsooth of religion, to obtain the favour. This occasioned

occasioned Constantine expressly to prohibit these sacrifices, &c. and to order the Nilometer to be removed into the church; whereas, till that time, it had been in the temple of Serapis. Julian the Apostate had it replaced in the temple, where it continued till the time of the great Theodosius. See, on the subject of Nilometers, the *Acta Eruditorum* Lips. anno. 1686, p. 147.

NILUFAR, in *Botany*, a name given by the ancient writers to the common water-lily. They distinguished this plant by that name, from the Indian nymphæa, whose root was of a cold and soporific virtue, like that of the mandrake. This they call always *nenusfar*.

NILUS, in *Ancient Geography*, an interior country of Arabia, which furnished myrrh and incense, according to Strabo, l. xvi.

NIMBO-ETCHAUK, in *Geography*, a town of Bengal; 36 miles N.W. of Ramgur.

NIMBURG, or **NIEMBURG**, a town of Bohemia, in the circle of Boleslaw, near the Elbe; 26 miles E.N.E. of Prague. N. lat. $50^{\circ} 8'$. E. long. $15^{\circ} 6'$.

NIMBUS, among the Romans, a scarf embroidered with gold, which women wore on their foreheads.

NIMBUS was likewise used for the money thrown among the people on any public occasion.

NIMBUS, in *Antiquity*, a circle observed on certain medals, around the heads of some emperors; answering to the areolæ, or circles of light, drawn around the images of saints. See **MEDAL**.

The nimbus is seen on the medals of Maurice, Phocas, and others even of the upper empire.

NIMEGUEN, or **NIMMEGEN**, in *Geography*, a very ancient, rich, strong, and populous city of Holland, on the S. side of the Wahab, said to have taken its name from Magus, king of the Gauls. It is the capital of the Lower Guelderland, and was anciently the capital of the whole duchy: it is also the chief town of Retuwa, or Batavia, the country of the Batavi. It has thirteen gates, and is defended by an ancient fortress, called Vlack-Hof, supposed to have been built about the time of Julius Cæsar; and several other fortifications. It was anciently a free city; and after Charlemagne had rebuilt the castle in the year 775, he made this the second imperial city of Lower Germany; Aix-la-Chapelle being the first, and Thionville the third. It was separated from the empire by William III., king of the Romans, and united to the comté of Holland in 1248, but sold by him in 1270, together with its territory, to Otho III., comte of Gueldres, whose successors remained masters of it till the states of Holland revolted against Spain. It was taken by the French in 1672, and after two years' possession, abandoned. The churches of Nimeguen are in general handsome structures; and the town-house is remarkable for its beauty and magnificence. The town was taken by the French in 1794; 50 miles S.E. of Amsterdam. N. lat. $51^{\circ} 53'$. E. long. $5^{\circ} 47'$.

NIMES, or **NEMS**, a town of Bohemia, in the circle of Boleslaw; 38 miles N. of Prague.

NIMES. See **NISMES**.

NIMEACUM, in *Ancient Geography*, a town in the Itinerary of Antonine, on the route from Castellum to Colonia Agrippina, between Minariacum and Camaracum; 18 miles from the former, and 14 from the latter.

NIMETULAHITES, a kind of religious among the Turks, so called from *Nimetulahi*, their institutor.

When a Turk would be admitted into the order, he is to shut himself up close in a chamber forty days, restricted to four ounces of food *per* day. The term expired, the Nimetulahites take him by the hand, and lead him a Moorish

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dance, accompanied with an infinity of ridiculous gesticulations, till the violence of the exercise, with his former regimen, throws him down on the ground. This fall is construed an extacy, during which he is supposed to have a vision.

The Nimetulahites meet every Monday in the night-time, and sing hymns to God, &c.

NIMGOUTA, in *Geography*, a town of Chinese Tartary, in the government of Kirin. N. lat. $44^{\circ} 23'$. E. long. $129^{\circ} 21'$.

NIMQUIPAR, a town of New Mexico, in the province of Hiaqui; 156 miles E. of Riochico.

NIMPHÆUM, in *Ancient Geography*, *Kerche*, a town of the Tauric Chersonesus, having, according to Strabo, a good port. It was situated N.W. of Acra, nearly E. of Zephyrium, and S.S.W. of the Bosphorus or Panticapæum.

NIMPTSCH, in *Geography*, a town of Silesia, in the principality of Brieg, near the Lohe, with a castle on an eminence. The Roman Catholics and the Lutherans have each a church; 25 miles S.E. of Brieg. N. lat. $50^{\circ} 37'$. E. long. $16^{\circ} 45'$.

NINAF, a town of Egypt, on the left bank of the Nile; 14 miles N. of Cairo.

NINDIA, a town of Bengal; 18 miles N. of Burdwan.

NINE FEET HARBOUR, a bay on the W. coast of Florida. N. lat. 27° . W. long. $82^{\circ} 50'$.

NINE ISLANDS, a cluster of small islands in the Pacific ocean, so called by Capt. Carteret. S. lat. $4^{\circ} 40'$. E. long. $154^{\circ} 30'$.

NINE-MILE-HOUSE, a village of the county of Tipperary, Ireland, well known to those who travel the great southern road, as the stage between Kilkenny and Clonmell. It is 71 miles S.W. from Dublin, and 11 miles N.E. from Clonmell.

NINE-PIN-COLLAR, that sort of horse-collar which is made somewhat in the form of the ninepin. See **COLLAR**.

NINETY-SIX, in *Geography*. See **CAMBRIDGE**.

NINGHAN, a town of Bengal; 18 miles N. of Burdwan.

NINGO, or **ALLAMPI**, a district or kingdom of Africa, on the Gold Coast, with a town of the same name; 43 miles W.S.W. from the river Volta. N. lat. $5^{\circ} 18'$. W. long. $0^{\circ} 36'$.

NING-PO, a city of the first class, in the province of Tche-kiang, called by the Europeans Liampo, and having an excellent port, on the eastern coast of China, opposite to Japan. This city is situated at the confluence of two rivers, called Kin and Yao, which form a channel, reaching to the sea, and sufficient for the navigation of vessels of 300 tons. These rivers water a plain, almost environed by mountains, and forming a kind of oval basin, whose diameter from E. to W. across the city may be about 20 miles, and that from N. to S. being much longer. This place, which resembles a garden, both by its level surface and cultivation, is full of trees and houses, and divided by a great number of canals. Eighteen or twenty leagues from this place is an island, called Tcheou-chan, where the English first landed on their arrival in China. The silks manufactured at Ningpo are much esteemed in foreign countries, especially in Japan, where the Chinese exchange them for copper, gold, and silver. This city has four others under its jurisdiction, besides a great number of fortresses. N. lat. $29^{\circ} 54'$. E. long. $120^{\circ} 14'$.

NINGUM, or **MINGUM**, in *Ancient Geography*, a town of Italy, upon the route from Aquileia to Salona, between

G

Tergette

Tergeste and Pucentium ; 28 miles from the first and 18 from the second. Anton. Itin.

NING-YUEN, a town of Chinese Tartary, situated on a river of the same name, near the gulf of Leao-tong ; 20 miles E.N.E. of Pekin.

NINIANS, Sr., a considerable town, and extensive parish, situated on the south bank of the river Forth, in the county of Stirling, Scotland. The ancient name of the parish was Egges ; nor is it exactly known at what time, or from whom it obtained its present appellation. The town is two miles from Stirling, and is noted for its manufacture of tartan, also for its tanneries ; and though it contains a population of 4000 persons, is still under the jurisdiction of the county magistrates only. Like most of the other parishes bordering on the Forth, that of St. Ninians is naturally divided into three regions, differing materially from each other in point of soil, fertility, and climate. These are the carse-lands, which approximate nearest to the river, the middle or dry-lands, and the muir-lands. In the two first-mentioned districts the country exhibits an appearance of high cultivation, and derives much picturesque effect from the windings of the Forth, and the variety of plantations and seats with which they abound. To the historian and the antiquary St. Ninians is a fruitful theme. Having been in very remote times situated near the confines of no less than four kingdoms, it was, beyond doubt, frequently the scene of contention between them, and was sometimes in the possession of one and sometimes of another, according to the decision of fortune. In succeeding ages, it became the theatre of some of the most glorious events in the annals of Scottish history. The celebrated battle of Bannockburn was fought within this parish on the 24th of June, 1314, and is still commemorated in the names of many spots, as well as by several monuments erected by the victorious army. The position occupied by the troops of Bruce is distinctly marked by numerous vestiges of military art. On Brocks-brae is an immense stone, called the Bore-stone, said to have supported the standard of the Scottish monarch ; and on Plainmuir, immediately behind the house which lately belonged to Bain Whyt, esq., is a small circular fortification, pointed out as the site of king Edward's tent. The battle of Sauchie-Burn, so fatal to the cause of James III., was likewise decided in this parish, not more than a mile from the field of Bannockburn. The house called Beaton's-mills, where the wounded monarch sought refuge after the engagement, and was put to death, is still standing, and may be ranked among the warning monuments of that ambition which so frequently endangered, and in the end brought about the total ruin of the royal family of Stuart.

The parish of St. Ninians extends, at a medium computation, about ten miles in length, and six in breadth ; and abounds with strata of lime-stone and coal, though these minerals are only wrought in a few particular spots. According to the parliamentary returns of 1811, it contains 1371 houses, and 7636 inhabitants, being an increase, since 1801, of 11 houses and 786 persons. Sinclair's Statistical Account of Scotland, vol. xviii. Beauties of Scotland, vol. iii.

NINIVEH, in *Ancient Geography*. See NINUS.

NIN-O, in *Chronology*, is the name of the era most commonly used among the Japanese. It commences with the reign of Sin-ma, the founder of their monarchy, 660 years before the Christian era.

NINO, in *Geography*, a town of Curdistan ; 50 miles W. of Erbil.

NINOVE, a town of France, in the department of the Scheldt, and chief place of a canton, in the district of Au-

denaerde, situated on the Dender, and having one handsome parish-church, rebuilt in 1718 ; 18 miles S.E. of Ghent. The place contains 3021, and the canton 16,773 inhabitants, on a territory of 212½ kilometres, in 15 communes.

NINSEA, a small island near the N. coast of Sardinia. N. lat. 48° 17'. E. long 9° 29'.

NINSI, in *Botany*, the specific name of a species of *Sium*, Linn. Sp. Pl. 361, called by the Japanese *Nisji*, or *Nindsin*, much celebrated by Kämpfer, in his Amoen. Exot. 818, for the virtues of its root ; which resembles that of *Ginseng* in form, and, as it seems, in reputed restorative qualities. Kämpfer says it is, next to Tea, the most famous plant of the East. See SIUM.

NINTH, in *Music*. The ninth, being one of the principal discords, must be regularly prepared and resolved ; but though it is only the octave of the second, and itself a second to the octave, yet it requires a very different treatment. The second is prepared and resolved in the base ; but the ninth must be prepared and resolved in the treble, and can very seldom have admission in fewer than three parts. The ninth is major or minor, according to the key in which it is used. The major ninth is prepared in a third, a fifth, and sometimes a sixth, but never in the eighth. It is resolved in a third, a sixth, or an eighth, from every one of the concords in which it is prepared. In four parts it is accompanied by the 3, and differs only from the common chord by being taken instead of the eighth by suspension. The minor ninth is prepared in the third only, and resolved in the eighth if the base is continued ; and resolved in the third, if the base falls a third. In four parts the sixth, and sometimes the fifth accompany it. Other discords may be joined with the ninth, as 2 or 7, and then both the discords must be prepared and resolved together. In four parts the 2 must be accompanied by the fifth, and the 7 by the third ; but in five parts both by the third and fifth.

NINTI POLONG, in *Zoology*, the Ceylonese name of a species of serpent, called also *serpens hypnoticus*. It is a very poisonous species, and its bite brings a sleep upon the person, which terminates in death. It is of a deep blackish-brown, variegated with small specks of white.

NINUS, in *Biography*, the reputed founder of the Assyrian monarchy, is represented as the son of Belus, and the commencement of his reign is supposed to have been about the year B.C. 2059. Little can be inferred from the facts recorded of this person : it is even doubted whether there ever was such a monarch, and other people confound him with the Egyptian Sesostris. He is said to have been of a very martial and ambitious disposition, and to have trained up a vast number of his subjects to the use of arms, and having made an alliance with Ariæus, king of the Arabians, he marched into the district of Baby'onia, the capital of that name not having yet been founded, and easily subdued it. He then invaded Armenia, the king of which, on making his submission, he left upon the throne as his vassal. He next overthrew and put to death the king of Media, and placing a confidential governor over that country, he proceeded to the conquest of the rest of Asia, all of which, except Bactria and India, he reduced under his dominion. Returning to Assyria, he founded the mighty city of Nineveh. He again took the field for the purpose of conquering Bactria, which had before resisted his arms, and the troops which he mustered on this occasion are stated at nearly two millions. He defeated the king of the country in the field, but made little progress in the siege of his strong capital. At this juncture, the husband of the celebrated Semiramis, who was a principal officer in the army of Ninus, impatient

of the absence of his spouse, sent for her to the camp before Bactria. This lady, distinguished for her courage, perceiving that the siege was feebly conducted, took a body of men with her; and climbing the rock upon which the citadel was seated, entered it, and thus gave the Assyrians the opportunity of becoming masters of the town. Ninus, first admiring her valour, was afterwards captivated with her beauty, and was not easy till he made her the partner of his throne, and he had by her a son named Ninyas. He brought back immense spoils from Bactria, and died after a reign of fifty years, leaving Semiramis regent of his vast dominions. Such is the history, or, perhaps, more properly speaking, the legend of Ninus; it has been admitted by various writers of antiquity, but certainly no great dependence can be placed upon it. Univer. Hist. Holberg's Univer. Hist.

NINUS, or *Nineveh*, in *Ancient Geography*, a town of Asia, the capital of Assyria, placed by Ptolemy, Ammianus, and Strabo, in the province of Adiabene, and so called from the name of its founder, Ninus, according to the testimony of profane historians. The Scripture ascribes its origin to Ashur, the son of Shem, or, as some have interpreted the passage, (Gen. x. 11.) to Nimrod, the son of Cush, and grandson of Ham. To this purpose Bochart gives the following translation of the original Hebrew: "From this place he (*i. e.* Nimrod) went out to go into Assyria, where he built Nineveh, Rehoboth, Calah, and Resen;" *i. e.* when Nimrod had established the beginning of his empire at Babylon, and in the land of Shinar, he advanced towards Assyria, where he built powerful cities, also many fortresses, to keep the people in subjection. On this subject, see ASHUR and ASSYRIA. Whoever was the founder of Nineveh, it appears to have been one of the most ancient, large, powerful, and famous cities of the world; and to have been situated on or near the Tigris, to the west, as some say, and according to others, to the east of this river. In the time of the prophet Jonah (ch. iv. 11.), it was reckoned to contain more than 120,000 persons, who could not distinguish their right hand from their left, or of young children who had not attained the age of reason; whence it has been inferred, that the number of inhabitants at that time amounted to 600,000 persons. Strabo allows it to have been much larger than Babylon. Diodorus Siculus says, (Bibl. lib. ii.) that it was 480 stadia in circumference, or forty-seven miles, and that it was surrounded with lofty walls and towers; the former being 100 feet high, and so broad, that three chariots might drive upon them abreast; and the latter, of which there were 1500, were each 200 feet high. Nineveh was taken by Arbaces and Belshazzar, in the year B. C. 747, under the reign of king Sardanapalus, in the time of Abaz, king of Judah, or about the time when Rome was founded. It was taken a second time by Assyages and Nabopolassar, from Chinaladan, king of Assyria, B. C. 626; and no more recovered its former splendour. It was entirely ruined in the time of Lucianus Samosatensis, who lived under the emperor Adrian. Under the Persians, however, it was rebuilt, but was destroyed by the Saracens about the seventh century. Modern travellers inform us, that the ruins of ancient Nineveh may still be seen on the eastern bank of the Tigris, and on the opposite side the city of Mosul, which many do not distinguish from Nineveh. See MOSUL.

NINZIN, in the *Materia Medica*, a name used by some authors for the famous Chinese root, commonly called *ginseng*. See NINSI.

NIO, in *Geography*, an island of the Grecian Archipelago, anciently known under the name of *Ios*, because it was peopled by Ionians, is lofty, mountainous, and in-

terfected by some vallies and some plains that are not very extensive, and is little more than 40 miles in circuit. The base is every where schistose or granitical, and its mountains are for the greater part calcareous. Its population includes 3700 persons of the Greek church. This island pays to the captain-pacha nearly 9000 piastres, collected by a Greek waiwode, who is appointed by the Porte, and who maintains order and administers justice, conjointly with six primates, whom the inhabitants elect every year in a general assembly. This island would have almost escaped notice, if Homer, passing from Samos to Athens, had not anchored in its harbour, and died there a few days after. The inhabitants paid the respect to his memory of erecting a monument, no vestige of which now remains. Most of the medals of Nio bear a palm-tree on the reverse, though this tree is no longer cultivated in the island, as the climate is not sufficiently warm for the purpose. The inhabitants are chiefly cultivators, few of them being mariners or merchants; and as they are active and laborious, water the grounds intended to supply herbage and fruits, and well manure the soil, they render it, though naturally far from being fertile, in a considerable degree productive. The women employ themselves in spinning the cotton which they gather, and in knitting stockings and caps for sale. This island furnishes wine, not only to all its inhabitants, but also to those vessels which anchor in the harbour. When the season is good, they gather about 50,000 oke of oil, of indifferent quality. The wheat, barley, and legumes are generally sufficient for the consumption of nine or ten months. Cotton, to the amount of from eight to ten thousand oke, and also stockings and caps, are annually exported for Ancona and Venice; and some cotton cloths are manufactured and consumed in the island. A small quantity of wax and honey is exported. The island breeds 400 small sized oxen, 6000 goats, and 300 sheep. Cheese is an article of exportation, but of little importance. The harbour is on the S.S.W. side of the island; and the town, seated on an eminence, is half a league from it; it is tolerably well built, and seems to occupy the site of the ancient city. Sonnini says, that the inhabitants are hospitable and affable; whereas Tournefort, in his time, has described the Niois as thieves and robbers. The festival of St. Gregory, celebrated by the Greeks in this island, as well as in some others of the Archipelago, is consecrated to cockroaches, which are here, particularly in summer, very disgusting and troublesome insects. They also note the festival of St. John the Baptist; and they abstain from undertaking any business of importance on the same day of the week throughout the whole year, because superstition leads them to imagine, that its issue would be unprosperous. N. lat. 36° 46'. E. long. 5° 24'. Olivier. Sonnini.

NION, or NYON, a town of Switzerland, in the Pays de Vaud, delightfully situated upon the edge of the lake of Geneva. It was formerly called "Colonia Equestris Noiodunum;" and in proof of its antiquity, Roman inscriptions and other ancient remains have been frequently discovered in the outskirts of the town. In this part the lake forms a beautiful curve, happily alluded to by Lucan, where he mentions the army of Julius Cæsar striking their tents, which were posted on the borders:

"Deseruerè cava tentoria fixa Lemano."

i. e. "They strike their tents, and quit the hollow bend of Lemano's lake."

The modern manufacture of this town is a beautiful porcelain; 10 miles N. of Geneva. N. lat. 46° 24'. E. long. 6° 6'.

NIONS. See NYONS.

NIORT, a town of France, and capital of the department of the Two Sevrés, seated on the river Sevre Niortoise. It is divided into two parts, each of which comprehends 7514 inhabitants, the canton of one including 12,502, and that of the other 11,714 inhabitants, on a territory of 215 kilometres, in 13 communes. N. lat. 46° 19'. W. long. 0° 23'.

NIOFA, in *Botany*, a barbarous name adopted by Lamarck and Poiret, from the Hortus Malabaricus. Lamarck Illustr. t. 299. Poiret in Lam. Dict. v. 4. 490. (Karin-Njoti; Rheede Hort. Malab. v. 6. 31.)—Class and order, *Ocandria Monogynia*. Nat. Ord. *Guttifera*, sect. 3. Juss.

Gen. Ch. *Cal.* Perianth inferior, of one leaf, in four shallow rounded segments, permanent. *Cor.* Petals four, equal, oblong, spreading, broad at the base. *Stam.* Filaments eight, inserted into the receptacle, awl-shaped, equal, rather shorter than the corolla; anthers incumbent, arrow-shaped. *Pist.* Germen superior, four-lobed, probably four-celled; style central, awl-shaped, the length of the stamens; stigma simple. *Peric.* Capsule solitary, ovate, with a short oblique point, thick and woody, of one cell, apparently not bursting. *Seed* solitary, oval, filling the cavity.

Eff. Ch. Calyx in four rounded segments. Petals four, spreading, much longer than the calyx. Germen four-lobed. Stigma simple. Capsule solitary, ovate, woody, of one cell, filled by the solitary seed.

1. *N. pendula*. (N. tetrapetala and pentapetala; Poir. as above. Karin-Njoti; Rheede, v. 6 t. 18.)—Gathered by Commerçon in Madagascar. Rheede says his plant grows in sandy ground on the coast of Malabar, as well as in Ceylon. He describes it as a lofty tree, as thick as a man's body, the wood white and bitter. So we find it in Commerçon's specimen. The leaves in that specimen are alternate, on stalks nearly an inch long, elliptic-oblong, or somewhat obovate, obtuse, with a very slight blunt point, entire, coriaceous, smooth, and shining, four inches long, and above one broad, furnished with one rib, and a multiplicity of finely reticulated veins. *Stipulas* none. *Flower-stalks* solitary, lateral, but scarcely axillary, usually as long or longer than the leaves, in one instance shorter, furnished with a minute scale or bractea at the base, pendulous, each bearing an umbel of several flowers. *Partial stalks* above an inch long, angular, smooth. *Flowers* about as large as those of an Orange, to which genus the younger Linnæus suspected this plant might belong. The petals are elliptic-oblong, obtuse, folding laterally over each other in the bud, finely downy externally. Rheede says they are on one side of a yellowish-white, on the other (we presume the inner) nearly blood-coloured. *Stamens* orange, with red anthers. He describes the flowers as without smell, the leaves and seed intensely bitter. Lamarck's figure is diminished, except the fruit, which agrees with Rheede's, and is as big as a moderate walnut. We have no doubt that both these authors describe the very same species, though in the Hortus Malabaricus, five petals are represented, with only as many stamens. It is well known that this work cannot be implicitly trusted in the latter particular, and the description says the petals are three or four, sometimes five. The materials on which M. Poiret has founded two distinct species, seem to us therefore insufficient.

A specimen agreeing with that of Commerçon was sent by Koenig to sir Joseph Banks, for the Samandara of Hermann, Mus. Zeyl. 5, and Linn. Fl. Zeyl. 202, a tree which the latter could not refer to any particular genus. He cites as a synonym the Nagam, Hort. Mal. v. 6. 37. t. 21, which is certainly the HERITIERA, see that article, to which all authors have referred the Samandara. It seems

therefore that Koenig has, in this instance, been mistaken. The other synonyms of Linnæus, as mentioning the presence of several capsules to each flower, indicate the *Heritiera* and not the *Niota*.

We retain with reluctance this barbarous, though not uncouth, name. The genus should be inserted near to *Allophylus* in the Linnæan system.

NIP, in *Rural Economy*, a provincial term applied to a near split-farthing housewife.

NIPA, in *Botany*, the Malay name of this plant, being unexceptionable as to sound, is retained by Thunberg for the genus. Thunb. Act. Holm. 1782. v. 3. 231. Nov. Gen. 90. Schreb. 777. Willd. Sp. Pl. v. 4. 597. Juss. 38. Lamarck Illustr. t. 897. (Nypa; Rumph. Amboin. v. 1. 69. t. 16.)—Class and order, *Monoclea Monadelphica*. Nat. Ord. *Palme*, Juss.

Gen. Ch. Male flowers lateral, below the female, on the same plant. *Cal.* Perianth proper none. Sheaths oblong, concave, pointed, coriaceous; the outer larger; closing gradually upon the inner. *Cor.* Petals six, linear, equal, spreading or reflexed. *Stam.* Filament one, thread-shaped, erect, the length of the petals; anthers twelve, terminating the filament, combined, oblong. Female flowers terminal. *Cal.* as in the male. *Cor.* none. *Pist.* Germen angular, (frequently five-sided), obliquely truncated, smooth; style none; stigma a lateral furrow. *Peric.* Drupas numerous, collected into an angular head about eight inches in diameter; angles acute or obtuse; attenuated below, blunted above, smooth.

Eff. Ch. Male, Calyx none. Petals six. Filament simple. Anthers twelve, combined. Female, Calyx none. Corolla none. Style none. Stigma a lateral furrow. Drupa angular, with a single seed.

1. *N. fruticans*. Thunb. Rumph. v. 1. t. 16.—Native of Java, and other of the East Indian islands. Stem in the young plant none, but rising to some feet in height, when the palm is grown to maturity. Leaves pinnate; leaflets opposite, striated, margined, pointed, smooth. Male and Female flowers on the same plant, but distinct, on different stalks; males several, lateral, inferior, in spikes, placed on dichotomous stalks; females terminal, sessile, forming a little globular head.

Thunberg informs us that the Indians use the leaves of this palm for covering houses and making mats. The fruit also is esculent both in a crude state and when preserved.

NIPAL, in *Geography*. See NEPAUL.

NIPASKEE, a lake of North America. N. lat. 62° 10'. W. long. 101°.

NIPEGON, a large river of North America, which, flowing from the north, discharges itself into lake Superior. It leads to a tribe of the Chippewas, who inhabit near a lake of the same name, situated about half-way between lake Superior and Albany river. Near it is a small river, which, just before it enters the lake, has a perpendicular fall from the top of a mountain of 600 feet.

NIPES, a town on the north-west coast of Hispaniola; 25 miles W. of Petite Goave.

NIPHATIS, in *Ancient Geography*, a mountain of Asia, in Armenia, which, according to Ptolemy, was a part of mount Taurus, south of mount Abos, and towards the source of the Tigris, which traversed it by a subterranean passage of about 25 miles.

NIPHON, **NIPON**, or *Nifon*, in *Geography*, the principal island of Japan, which is applied by the inhabitants to the whole of it. It lies north-east of the islands of Kiusiu, termed also Saikokf or the western country, and Sikokf.

Its

Its length from S.W. to N.E. is not less than 750 British miles; but it is so narrow in proportion, that the medial breadth cannot be assumed above 80, though in two projecting parts it may double that number. The five principal cities in this island are Meaco or Miaco, Jedo, OIacca, Sarunga, and Saccai. N. lat. $33^{\circ} 45'$ to 40° . E. long. 130° to 140° . See JAPAN.

NIPISIGHT BAY, a name given to the southern projection of Chaleur bay; and a river of this name falls into it from the south-west, by a broad bay-like mouth.

NIPISSING LAKE, a lake of Upper Canada, north-east of lake Huron, and connected with it by French river.

NIPISSINS, Indians inhabiting near the head-waters of Ottawas river. The number of warriors is 300.

NIPPERS, in the *Manege*, are four teeth in the fore-part of a horse's mouth, two in the upper, and two in the lower jaw. A horse puts them forth between the second and third year.

NIPPERS is also an instrument in use among smiths and farriers, being a kind of pincers, wherewith, in shoeing a horse, they cut the nails before they rivet them. It is also used in taking off a shoe.

NIPPERS, in a ship, are pieces of flat braided cordage, used to fasten the cable to the voyal, in a ship of war, when the former is drawn into the ship, by mechanical powers applied to the latter. These nippers are usually six or eight feet in length, according to the size of the cable; and five or six of them are commonly fastened about the cable and voyal at once, in order to be heaved in by the capstern. Those which are farthest aft are always taken off, as the cable approaches the main hatchway; and others are at the same time fastened on, in the fore part of the ship, to supply their place. The persons, employed to bind the nippers about the cable and voyal, are called *nipper-men*: they are assisted, at this office, by the boys of the ship, who always supply them with nippers, and receive the ends of those which are fastened, to walk aft with them, and take them off at the proper place, in order to return them to the nipper-men. Falconer.

NIPPLE, PAPILLA, in *Anatomy*, a prominence arising from the middle of the breast or mamma. See BREAST.

The nipples of women, in their first lying in, are frequently so small, and sunk into their breasts, that the infant cannot get at them to suck its nourishment. The readiest method, in this case, is to apply an infant somewhat older, and which can draw stronger; or, if this does not succeed, to let a woman, who has been practised in the art, attempt to suck.

When these do not succeed, it is common to have recourse to a glass pipe, and the poorer people in some places usually make a tobacco-pipe serve the turn. Others apply a small cucurbit, made of ivory, in the form of a hat, which they suck strongly in their mouth. The common sucking-glass is also, when properly applied, of very signal service. To do this, the small hole at the side is to be stopped with wax, and the glass heated with warm water; or, by holding it before the fire, so as to rarefy, and in part expel the air: it is then to be applied to the nipple, which, in this case, will not only be pulled out, but will discharge a large quantity of milk, so as to take down the inflammation and tumour in the breast. When the sucking power of the glass is grown weak, the hole at the side is to be opened, and the milk poured out: the glass is then to be heated again, and the hole being stopped again, is to be a second time applied; and so on, till the intention is fully answered.

NIPPLE-Wort, in *Botany*. See LAPSANA.

The common nipple-wort, which is a weed, growing by

the side of foot-paths and hedges, was formerly esteemed excellent for curing ulcerated nipples, whence it obtained its name. It is said to be drying, detergent, and digestive. The leaves and stalks may be boiled and eaten. James.

NIQUI, in *Ichthyology*, the name of a fish of the cucullus kind, approaching to the figure of that species commonly called *draco* and *araneus marinus*, and in English the *weaver*. It is common about the American shores, and is eatable when the liver and gall are taken out, otherwise it is said to be poisonous. See TRACHINUS *Draco*.

NIR, in the *Materia Medica*, a name given by the Arabian physicians to the pigment, or colour made from the *ifat*, or woad.

NIRANEE, in *Geography*, a town of Hindoostan, in Allahabad; 16 miles W.N.W. of Currah.

NIRIS, a town of Persia, in the province of Farsistan; 75 miles E. of Schiras.

NIRNOVA, a river of Moldavia, which runs into the Pruth.

NIRVA, a town of Japan, in the island of Nippon; 80 miles E.N.E. of Meaco.

NIRUA, a town of South America, in the province of Caraccas; 30 miles N.W. of Segovia Nueva.

NISAMPARA, a town of Hindoostan, in Bahar; 23 miles S.S.W. of Patna.

NISAN, in *Chronology*, a month of the Hebrews, answering to our March, and which sometimes takes from February, or April, according to the course of the moon. It was made the first month of the sacred year, at the coming out of Egypt. *This month shall be unto you the beginning of months, it shall be the first month of the year to you.* (Exod. xii. 2) It was the seventh month of the civil year. Moses calls it *Abib*. The name Nisan is only since the time of Ezra, and the return from the captivity of Babylon.

NISAO, in *Geography*, a river which rises in the centre of the island of St. Domingo, and falls into the sea on the south side, 7 miles W. of Nigua river.

NISARI, anciently *Nisyros*, an island of the Mediterranean, facing cape Crio, from which it is distant only three leagues. It seems to have been separated from the island of Stancho; and of its origin the ancient poets have given the following allegorical account. Neptune, it is said, being in pursuit of a giant, detached a piece of the island of Cos, in order to overwhelm him; and this piece, under which the giant was crushed, became the island of Nisari, on which a temple to Neptune was erected, in order to commemorate its formation. Under this allegory we may discover that the effort of Neptune to conquer the resistance of the giant, means no more than the violence of an irruption of the waters, which, bursting through every obstacle, worked for themselves a passage across the lands of Cos or of Stancho. Nisari is an island of small extent, elevated, and stony: it presents warm waters, and other vestiges of volcanoes; grind-stones are very common, and it produces several sorts of commodities in abundance; but it wants a harbour where vessels can cast anchor in safety. Nisari is distant 20 miles from Rhodes. N. lat. $36^{\circ} 35'$. E. long. 27° .

NISDORE, a town of Bohemia, in the circle of Leitmeritz; 10 miles N. of Kamnitz.

NISEMASSE, a cluster of small islands in the East Indian sea. N. lat. $8^{\circ} 15'$. E. long. $128^{\circ} 42'$.

NISII, one of the smaller western islands of Scotland. N. lat. $56^{\circ} 14'$. W. long. $5^{\circ} 48'$.

NISHAMPOUR, a town of Bengal, and chief place of the circar of Poostola. N. lat. $25^{\circ} 5'$. E. long. $88^{\circ} 38'$.

NISI, a town of European Turkey, in the Morea. N. lat. $37^{\circ} 10'$. E. long. 22° .

NISIBIN,

NISIBIN, anciently *Nisibis*, a fortress of Asiatic Turkey, in the government of Mosul; 70 miles N.W. of Mosul. N. lat. 37°. E. long. 40° 30'.

NISIBIS, in *Ancient Geography*, a large and populous city of Mesopotamia, about two days' journey from the Tigris, in the midst of a pleasant and fertile plain, at the foot of mount Masius, and on the river Mygdonia. A treble inclosure of brick walls are defended by a deep ditch. In the year of Rome 684, it was subject to Tigranes, king of Armenia, from whom it was taken by Lucullus. It was afterwards taken by Trajan, and, after a revolt, retaken by his troops. Since the time of Lucullus, it had been deservedly esteemed the bulwark of the east. It sustained three memorable sieges against the power of Sapor, king of Persia; and the disappointed monarch, after urging his attacks above 60, 80, and 100 days, was thrice repulsed with loss and ignominy. But in the year 363 of the Christian era, after the death of Julian, and under the irresolute emperor Jovian, it surrendered to Sapor by treaty. It is now reduced to 150 houses. The marshy lands in its vicinity produce rice; and the fertile meadows, as far as Mosul and the Tigris, are covered with the ruins of towns and villages.

NISIDA, in *Geography*, a small island, evidently formed by volcanic explosion, in the south-east corner of the gulf of Puzzuolo, near the main land, fertile, and well cultivated. On the south coast is a small harbour, called "Porto Pavone;" and on a neighbouring rock stands a Lazaretto, where ships bound for Naples are obliged to perform quarantine. This island abounds in rabbits and large black snakes: its chief produce is oil; 5 miles W.S.W. of Naples.

NISI PRIUS, in *Law*, a judicial writ which lieth in cases where the jury being impanelled, and returned before the justices of the bench, one of the parties requests to have such writ, for the ease of the county, whereby to will the sheriff to cause the inquest to come before the justices in the same county, at their coming thither.

It is called a writ of *nisi prius*: and its effect is, that the sheriff is hereby commanded to bring to Westminster the men impanelled, at a certain day, before the justices, *nisi prius justiciarii domini regis ad assisas capiendas venerint*; that is, unless the justices go, before that day, into such county to take assises. This they are sure to do, in the vacations preceding each Easter and Michaelmas terms, and there dispose of the cause; which saves much expence and trouble to the parties, the jury, and the witnesses. See JURY.

NISI PRIUS and *Assise Courts of*, are composed of two or more commissioners, who are twice in every year sent by the king's special commission, all round the kingdom, (except only London and Middlesex, where courts of *nisi prius* are holden in and after every term, before the chief or other judge of the several superior courts, and except the four northern counties, where the assises are holden only once a year,) to try, by a jury of the respective counties, the truth of such matters of fact as are then under dispute in the courts of Westminster-hall.

NISI PRIUS, *Justices of*. See ASSISES and JUSTICES.

The present justices of assise and *nisi prius* are more immediately derived from the statute Westm. 2. 13 Edw. I. c. 30, which directs them to be assigned out of the king's sworn justices, associating to themselves one or two discreet knights of each county. By statute 27 Edw. I. c. 4, (explained by 12 Edw. II. c. 3.) assises and inquests were allowed to be taken before any one justice of the court in which the plea was brought, associating to him one knight or other approved man of the county. And lastly, by

statute 14 Edw. III. c. 16, inquests of *nisi prius* may be taken before any justice of either bench, (though the plea be not depending in his own court,) or before the chief baron of the exchequer, if he be a man of the law; or otherwise before the justices of assise, so that one of these justices be a judge of the king's bench, or common pleas, or the king's serjeant sworn. For their circuits, see CIRCUIT.

NISITA, in *Geography*, a town of Naples, in the province of Lavora; seven miles W.S.W. of Cuma.

NISMA, a town of Saxony, in the bishopric of Naumburg; six miles E. of Zeitz.

NISMES, or NIMES, a town of France, and capital of the department of the Gard. It is large, and pleasantly situated on the declivity of a hill, covered with vineyards and orchards, not far from a small river called the "Vistre." Before the revolution, it was the seat of a particular government, and contained a seminary, a college, an academy of ancient history and belles lettres, several hospitals, a citadel, and about 32,594 inhabitants, of whom a third was supposed to be Protestants. It is divided into three parts, and is said to contain 39,300 inhabitants; and its three cantons include 14,972, 14,800, and 12,850 inhabitants, on a territory of 227½ kilometres, in four communes. It has various manufactures, the most considerable of which are cloth and silk: the number of stockings annually made in this town has been computed at 20,000 pair. This city was a large and magnificent city, before it was taken by the Goths. Its vestiges of Roman antiquity are grand and numerous; among which we may reckon an amphitheatre, a temple of Diana, a grand tower supposed to have been a mausoleum, a public fountain, and a temple of the Corinthian order, of exquisite taste, erected by the inhabitants, in the year of Rome 754, to the memory of Caius and Lucius, the sons of Agrippa. N. lat. 43° 50'. E. long. 4° 26'.

NISQUEUNIA, or NESTIGIUNA, a settlement of America, on the Mohawk river, between Albany and Schenectady. It is the principal seat of the society called "Shakers."

NISSA, a town of European Turkey, in Servia, situated on a river of the same name, which joins the Ibar, 30 miles N.N.W. of the town. It is surrounded with walls and ramparts, and contains several mosques, baths and fountains: the houses are constructed of clay and wood; 245 miles N.W. of Adrianople. N. lat. 43° 31'. E. long. 21° 36'.

NISSA, or NIZZA, a town of Portugal, in Alentejo; 21 miles E. of Abrantes.

NISSER, a lake of Norway, in the province of Christiansand; 35 miles W. of Skeen.

NISSOLIA, in *Botany*, so named by Jacquin and Linnaeus, in memory of William Nissolle, M.D. of Montpellier, author of several botanical essays, in the Memoires de l'Acad. des Sciences, and mentioned as an excellent naturalist by Tournefort, who dedicated a supposed genus to him, in the Inst. Rei Herb. 656, which is undoubtedly a *Lathyrus*, as all following botanists have made it. Jacq. Amer. 198. Linn. Gen. 365. Schreb. 483. Willd. Sp. Pl. v. 3. 899. Mart. Mill. Dict. v. 3. Juss. 364. Lamarck Illustr. t. 600. Gærtner. t. 145. Class and order, *Diadelphia Decandria*. Nat. Ord. *Papilionaceæ*, Linn. *Leguminosæ*, Juss.

Gen. Ch. *Cal.* Perianth of one leaf, inferior, bell-shaped, with five teeth; the upper ones most deeply divided. *Cor.* papilionaceous. Standard roundish, slightly emarginate, reflexed, its edges folded back. Wings oblong, obtuse,

tuse, erect, dilated upwards, spreading in the fore part. Keel closed, the shape of the wings. *Stam.* Filaments ten, united into a cylinder, which is split along the upper side; anthers roundish. *Pist.* Germen oblong, compressed; style awl-shaped, bent upwards at a right angle; stigma obtuse, somewhat capitate. *Peric.* Legume oblong, compressed, of two or three joints, separating transversely, spongy within, the uppermost terminating in a vertical expanded wing. *Seeds* solitary in each joint, kidney-shaped, seldom more than one perfected in each legume.

Eff. Ch. Calyx with five teeth. Stamens all connected. Legume jointed, single-seeded, ending in a dilated wing.

1. *N. arborea*. Upright Nissolia. Linn. Sp. Pl. 992. Jacq. Amer. 199. t. 174. f. 48.—Stem arboreous, erect. Leaves smooth.—Found by Jacquin, in woods at Carthagena, in South America, flowering in July and August. Linnæus received a specimen from Rolander, but scarcely any other botanist seems to have noticed this plant. It is described as a tree of no beauty, twelve feet high, whose long weak branches require support. *Leaves* deciduous, a span long, alternate, stalked, composed of one or two pair, with an odd one, of elliptic-oblong; pointed, entire *leaflets*, the terminal one rather the largest, two and a half or three inches in length; all on short, partial stalks, thin, smooth, with one rib and several transverse veins; shining above; glaucous beneath. *Stipules* none. *Flowers* in dense, short, axillary or terminal, stalked clusters, rather small, pale, inodorous. Jacquin describes them sessile, or spiked, but his figure indicates their having slender partial stalks, as in the Linnæan specimen. He delineates the *legume*, which we have not seen, above three inches long, compressed, with one fertile joint, a seed the size of a French bean, and a falcate veiny wing.

2. *N. ferruginea*. Rusty Nissolia. Willd. n. 2. (N. Quinata; Aubl. Guian. v. 2. 743. t. 297.)—Stem shrubby, climbing. Clusters compound. Leaves clothed with rusty down beneath.—Gathered by Aublet on the banks of the river Sinemari in Guiana, flowering and fruiting in October and November. The *stems* twine about the tallest trees to their very tops. The *leaflets* are about four pair with an odd one, gradually larger upwards, veiny, clothed with rusty down at the back. *Clusters* compound, large, terminal, the *stalks* and *calyx* covered with rusty down. *Petals* violet-coloured. *Legume* downy, the size of the last, but less falcate. The natives call this plant *Quinata*. The bark of the trunk exudes a red transparent atringent gum; probably like that of *Pterocarpus Draco*.

3. *N. fruticosa*. Shrubby Nissolia. Linn. Sp. Pl. 992. Jacq. Amer. 193. t. 179. f. 44. Hort. Vind. v. 2. 78. t. 167. Ait. Hort. Kew. ed 1. v. 3. 6.—Stem shrubby, climbing. Clusters whorled, leafy. Leaves smooth.—Gathered by Jacquin, in woods and bushy places at Carthagena, flowering in September. Lord Petre is said to have cultivated this plant in 1766. Linnæus had it in his stove, climbing to a great extent, but never flowering. Jacquin observed the same at Vienna, but after 15 years it blossomed. The *leaves* somewhat resemble the first species, but are not half so large. The *flowers* compose long, pendulous, whorled, partly leafy *clusters*, at the ends of the branches, and are variegated with yellow and crimson. *Legume* about an inch long, with a rounded, curved, veiny wing.

NISSUWA, or NAZAWA, in *Geography*, a town of Arabia, in the province of Oman; 80 miles S.W. of Mascat.

NISUS, in *Ornithology*, a name by which many authors

call the *accipiter fringillarius*, or sparrow-hawk. See FALCO Nisus.

NISUS is also a name used by some old naturalists for the haliaetus, or *aquila marina*, called in English the *sea-eagle*, or *osprey*. See FALCO *Offspring*.

NITCHOU, in *Geography*, a river which rises in a mountain of Thibet, and runs into the Burrampooter, at Ghergong.

NITCUDY, a river of Hindooستان, which runs into the Manzorah; 35 miles E. of Oudighir.

NITEDULA, in *Zoology*, the garden-mouse. See MYOXUS *Nitela*.

NITH, in *Geography*, a river of Scotland, which rises in Ayreshire, and passing through Dumfriesshire, enters Solway Frith, about 10 miles below Dumfries. The valley through which it flows is called "Nithdale" or "Nidfdale." This tract of ground is rich in coals, lime-stone, and free-stone; its soil is generally fertile, highly cultivated, and capable of farther improvement. Although it is now parcelled out among farmers, yet from some remains of old walls, it seems to have been formerly enclosed as parks for deer or cattle for the duke of Queensbury, whose property it is, and whose castle of Drumlanrig stands near. The mouth of the river is in N. lat. 55° 2'. W. long. 3° 32'.

NITHARD, in *Biography*, an historian of the ninth century, was the son of Angilbert, abbot of St. Riquier, and of Bertha, daughter of Charlemagne. He was born before the year 790, and was probably educated at the court of his grandfather. It is thought that he served in the armies of Charlemagne, in the post of duke or count of the maritime coast. He was much attached to Louis le Debonnaire, and likewise to his son, Charles the Bald, king of France. By this prince he was deputed in the year 840 to his brother, the emperor Lothaire, in order to accommodate the differences between them: in 842 he was one of the commissioners of Charles in regulating the partition territory with Louis of Germany. The want of success in endeavouring to preserve peace between these brothers disgusted him with the court, from which he retired, and is thought to have embraced the monastic life in the abbey of St. Riquier, though it has been asserted by others that he continued to serve in the army, and was only buried in that monastery. Nithard is known in the literary world as the author of a valuable work, containing the history of the divisions between the sons of Louis le Debonnaire, in four books, of which the first three were written in 842, and the fourth is lost. It was published in 1594 by M. Pithou in his "Annalium et Historiæ Francorum Scriptores, &c." The style of the work is obscure and embarrassed, but the narrative is methodical, and the author was well informed of the facts which he relates. It has since been translated by Duchesne and Bouquet in their Collection of French Historians. It was translated into French by Cousin in his "History of the Western Empire."

NITHERED, in *Agriculture*, a provincial word used to signify perishing with cold.

NITIDULA, in *Zoology*, a genus of insects of the order Coleoptera, of which the generic character is as follows: antennæ clavate, the club solid; shells margined; head prominent; thorax a little flattened, margined. There are forty-three species, divided into two sections, viz. those that have a cylindrical lip, and those that have a square lip. In the former division there are thirty-three species; in the latter only ten. These last form the tribe Elophorus of Fabricius. The insects are chiefly inhabitants of Europe; a few of them of South America, and some are common

mon to our own country. Those of section B are, for the most part, aquatic insects, found in stagnant waters, or under duck-weed. The rest are to be traced on plants and flowers.

A. *Lip cylindrical.*

Species.

* **BIPUSTULATA.** This species is oval and black; the shells have a red dot. It inhabits this country, and other parts of Europe. Destroys carcases, meat, and bacon, on which it feeds.

4-PUSTULATA. This is brown and oval; the shells are marked with two red spots. It inhabits Germany, and is larger than the last. The shells are sometimes spotted on the margin; the legs are rufous.

OBSCURA. Oval, black, dusky; the legs are pitchy. It inhabits Germany.

ABBREVIATA. This is oval, black, and rather dusky; the shells are smooth, obtuse, abbreviated. It inhabits New Zealand. The body is a little downy; the legs are rufous or black.

MARGINATA. Oval; shells grooved, the edge and spots on the disk ferruginous. It is found in Italy. The body is beneath pitchy, and the thorax black, with a broad ferruginous border.

* **ÆSTIVA.** Testaceous, subvillous; thorax transverse, emarginate; eyes black. This is an inhabitant of various parts of Europe.

OBSOLETA. Oval, testaceous; shells smooth; thorax emarginate.

* **FERRUGINEA.** Oval, subvillous, ferruginous; shells striate. This is an English insect, and found on the lycoperdon.

IMPERIALIS. Oval, black; shells with connected white spots, forming two streaks; the edge is rufous. It is found in Germany.

STRIGATA. Oval, brown; edge of the thorax and shells, line at the base, and streak across the tip of the latter fulvous. Found in Saxony.

10-GUTTATA. Oval, brown; edge of the thorax and five spots on the shell pale. It inhabits Germany.

VARIA. Oval; thorax and shells varied with black and ferruginous. It is found particularly at Keil.

SORDIDA. Oval, black; thorax and shells dull ferruginous. It is found in divers parts of Germany, and resembles the last.

FLEXUOSA. Oval, black; edge of the thorax and flexuous spot on the shells yellow. It is found in France.

BICOLOR. Ferruginous; shells black, with a ferruginous band at the base, and dot at the tip. It inhabits Keil.

COLON. Black; shells varied with ferruginous; thorax emarginate. It inhabits different parts of Europe.

LIBBATA. Black; edge of the thorax and border of the shells ferruginous. It inhabits Saxony, and is a very small insect.

HÆMORRHOIDALIS. Black; shells ferruginous at the tip. It inhabits Hamburg.

* **DISCOIDES.** Black; disk of the shells ferruginous; thorax margined. It is found in England, and in various parts of Germany.

* **RETICULARIA.** Black; shells smooth; thorax margined.

6-PUSTULATA. Black; shells truncate; three dots on

the shells, tail and legs rufous. Inhabits Germany on flowers, and is a small insect.

LITUA. Testaceous; shells with a black arched blotch. It inhabits Saxony, and is small.

TESTACEA. Thorax testaceous, with a black spot; shells testaceous, with a black band in the middle, dotted with testaceous. Found in Keil.

FLORALIS. Black; shells testaceous, the future black. An inhabitant of different parts of South America.

* **ÆNEA.** Brassy-green; antennæ and legs black. It inhabits England.

VIRIDESCENS. Brassy-green; legs rufous. It inhabits Keil.

HEMIPTERA. This is ferruginous; the shells are abbreviated, testaceous, immaculate. Found in some of the South American islands.

DIMIDIATA. Black; shells abbreviated, brown; legs ferruginous. This is a very minute insect, and is also found in the South American islands.

TRUNCATA. Testaceous; shells truncate, with a common black spot at the base. It is found in Germany.

* **RUFIPES.** Black, polished; legs pale. This is an English insect.

SETACEA. Ochraceous, immaculate; eyes black; shells very smooth.

PECTORALIS. Brown; head and legs ferruginous; club of the antennæ yellow.

PILOSA. Black; shells villous; antennæ and legs ferruginous. It inhabits Germany.

B. *Lip square.*

Species.

* **AQUATICA.** Brown; thorax rough, and with the shells brassy-brown. This, as well as the next, is found in many parts of Europe, and in this country in stagnant waters.

* **NUBILA.** Grey; thorax and shells grooved and rugged.

ELONGATA. Thorax punctured, brassy; shells brown, with longitudinal raised lines. Found in the stagnant waters of Germany.

CRENATA. Brown; thorax rugged; shells grooved crenate. This also is found in Germany.

HUMERALIS. Brown; thorax smooth; shells crenate, striate, with a humeral testaceous dot. It inhabits Germany, and is small.

FLAVIPES. Black; thorax grooved; striate shells and legs testaceous. It inhabits Sweden, in stagnant water.

PYGMÆA. Thorax margined, nearly smooth, black; shells striate, the tip and legs ferruginous.

* **MINIMA.** Thorax smooth; shells striate; body brown, immaculate. This is found in England, and other parts of Europe, and is, as its name denotes, very minute.

COCCINELLOIDES. Black; head, thorax, and shells fumate. Found in Europe.

* **FUSCA.** Brown-testaceous; shells punctured, striate; antennæ and legs testaceous. It inhabits this country, and other parts of Europe.

NITIDUM FOLIUM, among *Botanists*. See **LEAF**.

NITRARIA, in *Botany*, so named by Schober, a Russian botanist, who travelled under the sanction of government into Siberia, and who first discovered this plant on the squalid nitro-saline parts of the desert extending from the north of the Caspian sea to about the 50th degree of latitude. He also found it assuming rather a different appearance, in the

the salt plains of Siberia, between the Irtysh and Ob rivers, by the salt lakes near the Jenissea, and in the regions beyond the lake Baikal. Schob. in Nov. Act. Petrop. v. 7. 315. t. 10. Linn. Gen. 239. Schreb. 322. Willd. Sp. Pl. v. 2. 858. Mart. Mill. Dict. v. 3. Ait. Hort. Kew. ed. 2. v. 3. 147. Juss. 316. Lamarck Illustr. t. 403. Gærtn. t. 58. Class and order, *Dodecandria Monogynia*. Nat. Ord. *Ficoideæ*, Juss.

Gen. Ch. *Cal.* Perianth inferior, of one leaf, five-cleft, erect, very short, permanent. *Cor.* Petals five, oblong, spreading, channelled, arched at the tip with an inflexed point. *Stam.* Filaments fifteen, awl-shaped, nearly erect, the length of the corolla; anthers roundish. *Pist.* Germen superior, ovate, terminating in a thickish style longer than the stamens; stigma simple. *Peric.* Drupa of one cell, ovate-oblong, pointed. *Seed.* Nut solitary, three-celled, ovate, pointed.

Obf. Gærtner says, that the unripe germen is trilocular, and that the nut is scrobicular, of one cell and six-valved at the top.

Eff. Ch. Corolla of five petals, arched at their tips. Calyx five-cleft. Stamens fifteen. Drupa single-seeded.

1. *N. Schoberi*. Linn. Sp. Pl. 638. Pall. Ross. v. 1. p. 1. 80. t. 50. f. A. Andr. Repof. t. 529.—Leaves entire, obtuse.—Native of Siberia, in very rich salt lands by the lake Korakoffskoi. It flowers at Kew through the greater part of the summer. *Root* woody, knobbed or tuberous. *Stems* numerous, woody, spreading, prostrate, branched, from one to two feet in length, (the branches elegantly disposed like a winged leaf,) whitish-grey, generally spinous. *Leaves* four or five together, succulent. *Flowers* in a terminal cyme, about six together, of a delicate blue and white, with orange-coloured anthers. *Fruit* blue.

The different appearance assumed by this species when growing near the Caspian sea is delineated by Pallas in his *Flora Rossica* v. 1. t. 50. f. B. Willdenow calls it in that state *N. Schoberi* β , and says, that it has broader leaves, red berries, a conical nut, and spineless stem. This variety is larger than the Siberian one in all its parts, and may probably be a distinct species. Pallas says, that the berries, though saltish, are insipid, and yet reckoned a luxury in the Caspian desert. Camels are said to feed on the twigs. From the very succulent and saline properties of its leaves Murray conjectures, that it might be employed with advantage for the extraction of soda.

2. *N. tridentata*. Desfont. in Uft. Annal. v. 16. 101. Willd. n. 2.—Leaves three-toothed at their tips.—Native of moist and sandy spots near the sea in the neighbourhood of Sufa in the kingdom of Tunis, and on the borders of the desert. All we know of this is from Desfontaines, quoted above; who describes it as having “spinous branches, fleshy leaves, and a nut with only one cell instead of three.”

NITRATES, in *Chemistry*, that genus of salts formed by the nitric acid with the different saline bases. The great facility with which the nitric acid is decomposed by the different inflammable bodies, is the cause of the marked character of detonation possessed by these compounds. The heat and light furnished during the detonation of the nitrates with inflammable bodies, as in the case of gunpowder, has been used as a successful argument against the Lavoisierian doctrine of combustion. If the oxygen be the source of the light and heat, and that only when it passes from the elastic to the solid or liquid form, it will be evident, that cold ought to be produced from the detonation of the nitrates. It is now, however, pretty generally admitted, that bodies do not give out caloric in the ratio of their condensa-

tion, but in proportion to the change of specific heat during the chemical change. It is therefore highly probable, that no great quantity of heat is given out during the combination of nitrogen with oxygen to form nitric acid. It must also be admitted, that the inflammable bodies themselves give out a quantity of caloric during the detonation with nitre. A similar conclusion must be drawn in the action between oxymuriatic of potash and the inflammable bodies.

The greatest proportion of the soluble nitrates contain 2 atoms of acid to 1 of base, so that instead of considering the acid as 19, the weight of 1 atom, hydrogen being 1, it will be generally found 38. Those salts, which have been called sub-nitrates, are generally nitrates, in which the acid is 19. We shall now give an account of some of the nitrates that have been omitted in their proper places, and refer to others under their respective bases. Of these the most important is the nitrate of POTASH; which see.

NITRATE of Alumine. This salt is prepared by dissolving alumine in nitric acid, and evaporating the solution till the salt crystallises. In this salt there is always an excess of acid, and it is therefore sometimes reckoned a super-nitrate. It crystallises with great difficulty in thin soft plates, which have but little brilliancy. It has an acid and also an astringent taste. Its specific gravity, according to Hassenfratz, is 1.645. It is very soluble in water, and when the fluid is evaporated, it is converted into a glutinous mass of the consistence of honey. It often assumes on cooling the form of a jelly. When exposed to the air, it very soon attracts moisture and deliquesces. When heated, the acid is disengaged with great facility, and the earth remains behind.

NITRATE of Ammonia. This salt was formerly distinguished by the names of *nitrum semivolatile*, and *nitrum flammans*. Berthollet examined it in the course of his experiments on the component parts of nitric acid, and sir Humphrey Davy, in his researches, has added considerably to our knowledge of its composition and decomposition. It may be prepared by dissolving carbonate of ammonia in diluted nitric acid, and evaporating the solution till the salt crystallises. The appearance of this salt varies much according to the temperature at which its solution is evaporated. In a heat of from 70° to 100°, and by slow cooling, it is obtained in six-sided prisms, terminated by long six-sided pyramids. When the solution is evaporated at the temperature, of boiling water, or 212°, the crystals are channelled and have a fibrous texture, or they are formed of long elastic threads. When dried in a heat of about 300°, it assumes the form of a white and very compact mass. These differences are unquestionably owing to different proportions of water of crystallization, which the salt contains. Nitrate of ammonia has a very acrid, bitter, and disagreeable taste. Its specific gravity is, according to Hassenfratz, in the *Annales de Chimie*, 1.579. At the temperature of 60° it is soluble in two parts of water, and it dissolves in half its weight of boiling water. When exposed to the air, nitrate of ammonia soon attracts moisture and deliquesces. When it is heated in the state of crystals, it becomes fluid at a temperature below 300°, and at from 360° to 400° it boils without decomposition; but when heated to 450°, or higher, it is gradually decomposed without losing its water of crystallization. When this salt is decomposed in a temperature not exceeding 500°, it is wholly converted into nitrous oxyd and water. From the experiments of sir H. Davy these products are in about the proportion of four parts of gas to three of water. When exposed to a heat of 600°, and higher, it explodes, and is

totally decomposed, being converted into nitrous gas, nitrous acid, water and azotic gas. Hence its name among the older chemists, *nitrum flammans*. Its constituent parts, according to sir H. Davy, are

Acid	-	69.5	72.5	74.5
Base	-	18.4	19.3	19.8
Water	-	12.1	8.2	5.7
		100	100	100

In the first of these analyses the salt was prismatic; in the second it was fibrous; and in the third it was compact. The chief use of this salt is for yielding *NITROUS Oxyd*; which see.

NITRAT of Barytes is usually prepared by dissolving native carbonat of barytes in nitric acid, or by decomposing sulphuret of barytes by means of nitric acid, and evaporating the filtered solution till the nitrat crystallises. Its crystals are regular octahedrons, and they often adhere to each other in the form of stars. Sometimes it is obtained in small brilliant plates. Its specific gravity is 29.2 nearly. It is very easily reduced to powder. Its taste is hot, acrid, and austere. It is soluble in 12 parts of water at the temperature of 60°, and in about three or four parts of boiling water. As the solution cools, the salt may be obtained in crystals. It is scarcely at all altered by exposure to the air. When thrown on burning coals it decrepitates, undergoes a kind of fusion, and then becomes dry. When strongly heated in a crucible, the whole acid is gradually driven off, and the barytes remains pure. It detonates less violently with combustibles than most of the nitrats. The constituents are given by Fourcroy and Vauquelin, in the *Annales de Chimie*, as follows:

Acid	-	-	38
Base	-	-	50
Water	-	-	12
			100

NITRAT of Glucine. See GLYCINE.

NITRAT of Lime. See LIME.

NITRAT of Magnesia. See MAGNESIA.

NITRAT of Magnesia and Ammonia was first described by Fourcroy in 1790, and is prepared by mixing together the solutions of nitrat of ammonia and nitrat of magnesia, or by decomposing either of these salts in part by the base of the other. When the two salts are mixed together, the nitrat of ammonia and magnesia gradually precipitates in crystals. These crystals are in the form of fine prisms; they have a bitter acrid ammoniacal taste; are soluble in about 11 parts of water at the heat of 60°, and in less as the temperature is higher. When exposed to the air, they gradually attract moisture, but more slowly than either of their component parts. The phenomena, which this compound exhibits when heated, are similar to those which its component parts exhibit in like circumstances. According to Fourcroy it is composed of

78 parts of nitrat of magnesia,
22 ————— ammonia.

NITRAT of Silver, in the *Materia Medica*. See SILVER.

NITRAT of Soda. See SODA.

NITRAT of Strontian. See STRONTIAN.

NITRAT of Yttria. See YTTRIA.

NITRAT of Zirconia. See ZIRCONIA.

NITRAT of Ammonia, in *Agriculture*, a neutral saline substance formed by the combination of the nitric acid and

ammonia, or volatile alkali. This substance cannot be obtained in sufficient proportions for the purposes of agriculture, but is useful in the analysis of soils.

NITRAT of Iron, a salt formed by the union of nitric acid with iron, but is a salt rarely presented by nature: its properties or effects, as they may apply to agriculture, are not, Lord Dundonald says, worthy of much observation.

NITRAT of Lime, is an earthy salt which consists of the nitric acid and lime. It is found in the mother-earth of nitre manufactories, on old walls, and mixed with true native nitre in the kingdom of Naples. The purest is obtained by the artificial and direct combination of its constituent parts. And it is a saline substance, that is also found in the rubbish of old buildings, and in those materials from which saltpetre is extracted: viz. animal and vegetable matters, which, with a due proportion of calcareous earth, have undergone the putrefactive process, together with a subsequent, sufficiently long, exposure to atmospheric air. According to Dr. Home, it is likewise contained in what is commonly called hard-water, which, by his experiments, was found to promote the growth of plants in a much higher degree than soft-water. It is very soluble and deliquescent; it is decomposed by fixed alkalies, and forms therewith nitrat of potash or saltpetre, and nitrat of soda, or cubic nitre.

NITRAT of Magnesia, is an earthy salt, composed of the nitric acid and pure magnesia. It is found native in the mother-earth of nitre manufactories, and on walls. It has been obtained artificially by direct and indirect combination.

Lord Dundonald remarks that no agricultural experiments have yet been made with this compound; it is a very deliquescent and soluble salt; and there is reason to expect, that it will produce effects in promoting vegetation, similar to those which may result from the application of the nitrat of lime.

It is decomposed by alkalies and lime, and forms therewith nitrat of potash, nitrat of soda, and nitrat of lime.

NITRAT of Potash, a neutral salt, formed by the combination of nitric acid and potash, or the fixed vegetable alkali. It is found in the fissures of the lime-stone hills, near Molfetta, in the kingdom of Naples, in various waters, and even in rain: likewise in the fresh juices of many plants, such as the heliotrope, pellitory, tobacco, and others. It is produced spontaneously wherever its alkaline basis is exposed to a free current of air, and to the exhalations of putrescent vegetable and animal matter; as on damp walls, rubbish, the ordure of stables, dunghills, &c. In Spain, the East Indies, and near Lima, it is generated upon commons and uncultivated ground; and it is even asserted that in the southern regions of Spain, saltpetre is found in the dust of the high roads. Lord Dundonald, in his treatise on the Connection of Agriculture with Chemistry, states "that it is constituted by the putrefaction and complete decomposition of animal and vegetable substances, when mixed with calcareous matter and wood ashes." It is found to promote vegetation, but is too expensive to be used as a manure for land.

NITRAT of Soda, a very soluble substance, formed from the combination of the nitric acid and the mineral alkali, or soda, which, on account of the figure of its crystals, has obtained the name of *cubic*, or more properly, of rhomboidal nitre. Bergmann distinguishes it by the name of nitrated soda, and modern chemists by that of nitrat of soda. It has not hitherto been found in a native state, but is always produced, either directly or indirectly, by the artificial combination of its constituent parts. "Lord Dundonald

nald supposes it capable of promoting vegetation in an equal degree with the nitrat of potash."

NITRE, in *Chemistry*, the *Materia Medica*, &c. See *Nitrat of Potash*, under **POTASH**.

NITRE, in *Agriculture*, a term formerly applied to a salt extracted in Persia and the East Indies, from certain earths that lie on the sides of hills; and artificially produced, in some parts of Europe, from animal and vegetable matters rotted together (with the addition of lime and ashes), and exposed for a length of time to the air, without the access of which nitre is never generated.

It was formerly supposed to have much influence in the business of vegetation. See *NITRAT of Potash*.

NITRE, *Alkalised*, is the fixed alkali remaining after the nitrous acid has been destroyed by its detonation with any inflammable matter. This alkali is generally called *fixed nitre*.

NITRE, *Ammoniacal*, is a neutral salt resulting from the combination of the nitrous acid, to the point of saturation, with volatile alkali. The acid, in the most concentrated state in which it is commonly met with, saturates about five-sixths its weight of vegetable fixed alkali.

NITRE, *Antimoniated*. See **ANTIMONY**.

NITRE, *Calcareous*, is a neutral salt, compounded of the nitrous acid combined to saturation with a calcareous earth; and generally called *nitre with an earthy basis*. This salt is very deliquescent, but incapable of a true crystallization. It has a poignant, acrid, and bitter taste. See **NITRUM Calcareum**.

NITRE, *Clyffus of*. See **CLYSSUS**.

NITRE, *Crystals of*. See **CRYSTAL**.

NITRE, *Cubic*, or *Quadrangular*, is a neutral salt, formed by the nitrous acid when saturated with mineral alkali. This crystallises not into a prismatic but a cubical figure, and sometimes into parallelepipeds, with rhomboidal faces. It is inferior to ordinary nitre, and never used.

NITRE, *Decoction of*, is prepared by boiling half an ounce of nitre, and two ounces of fine sugar, with a scruple of cochineal as a colouring material, in $2\frac{1}{2}$ pints of water, till half a pint is wasted, and after standing to settle, the clear purplish-red liquor is poured off for use.

NITRE, *Diaphoretic, of Antimony*. See **ANTIMONY**.

NITRE, *Fixed by Arsenic*, is the alkali of nitre, the acid of which has been expelled in an open fire by means of arsenic, of which some portion is retained by the alkali. This may be employed as a flux, as it greatly assists vitrification.

NITRE, *Fixed by Coals*. See **FIXED NITRE**.

NITRE, *Fixed by Metals*, is the alkali of nitre separated from its acid, and mixed with the earth of the calcined metals.

NITRE, *Fixed by Tartar*, is the alkali of nitre and that of tartar mixed together by means of detonation. This is called the *white flux*.

NITRE, *Glauber's Spirit of*. See **SPIRIT**, and **NITRIC Acid**.

NITRES, *Metallic*, a general denomination that comprehends all neutral salts composed of the nitrous acid united with a metallic substance; the several kinds of which may be thus distinguished, viz. *nitre of silver*, called *lunar crystals*, *nitre of lead*, *nitre of mercury*, &c. The acid acts in general powerfully upon all metallic substances, but with remarkable differences, depending on the peculiar natures of the metals. It dissolves zinc, iron, copper, bismuth, lead, mercury, and silver, the most readily of all the acids; tin it dissolves imperfectly; regulus of antimony it only corrodes; gold and platina cannot be dissolved by nitrous acid alone, without the concurrence of marine acid.

NITRE, *Nitred*. See **NITRUM Nitratum**.

NITRE, *Purified*. See **NITRUM Purificatum**.

NITRE, *Spirit of*. See **SPIRIT**.

NITRE, *Troches of*, are made by grinding one part of the purified salt with three parts of fine sugar, and making up the mixture with mucilage of gum tragacanth.

NITRE, *Vegetating*. See **NITRUM Vegetans**.

NITRE, *Vitriolated*. See **NITRUM Vitriolatum**.

NITRIC ACID, in *Chemistry*, so called by the French chemists in 1787, is a compound of great value in the hands of the analytical chemist. Although this acid may be formed synthetically, in very small quantity, by passing electric sparks, in quick succession, through a mixture of oxygen and nitrogen gases, it is, for all useful purposes, obtained from nitre (nitrat of potash). It appears first to have been procured from this substance by Raymond Lully in the 13th century, by distilling it from a mixture of nitre and clay. This method is still practised in some manufactories, but it is more generally procured by decomposing the nitre by means of sulphuric acid, a process first discovered by Glauber.

Into a glass retort put two parts of nitre and one of sulphuric acid, of the specific gravity of 1.85. A capacious quelled receiver is now to be luted to the retort: the heat of a lamp or a sand-bath must then be gently applied. The nitric acid soon begins to be evolved, which condenses in the neck of the retort, and runs into the receiver, of a pale yellow colour. As the heat is increased, yellow fumes arise, and the vapour becomes more difficultly condensed. In this stage of the process some of the acid is decomposed into nitrous gas and oxygen gas. These elastic fluids render the quelled receiver, or a tube of safety, highly necessary. The last portion of acid is not brought off till the heat has been raised almost to redness.

The liquid obtained by this process was called by the old chemists spirit of nitre, and aquafortis. It is of a deep yellow or orange colour, and consists, if the materials employed be pure, of nitric acid mixed with nitrous gas, to which it owes its yellow colour; as when this gas is expelled by heat the acid becomes colourless as water.

In the large way, and for the purposes of the arts, this acid is made in extremely thick cast iron or earthen retorts, to which an earthen head is adapted, and connected with a range of proper condensers. The strength of the acid is varied by putting more or less water in the receivers. The nitric acid, thus made, generally contains sulphuric acid, and muriatic acid from the impurity of the nitrat employed. If the former, a solution of nitrat of barytes will occasion a white precipitate: if the latter, nitrat of silver will render it milky. The sulphuric acid may be separated by a second distillation from very pure nitre, equal in weight to an eighth of that originally employed; or by precipitating with nitrat of barytes, decanting the clear liquid, and distilling it. The muriatic acid may be separated by proceeding in the same way with nitrat of silver, or with litharge, decanting the clear liquor, and re-distilling it, leaving an eighth or tenth part in the retort. The acid for the last process should be condensed as much as possible, and the re-distillation conducted very slowly; and if it be stopped when half is come over, beautiful crystals of muriat of lead will be obtained on cooling the remainder, if litharge be used. Other methods are mentioned for the obtaining aquafortis or nitric acid. The following, which differs but little from that of Glauber, is given by sir Humphrey Davy in his *Elements of Chemical Philosophy*. "It is," he says, "procured, for the purpose of chemistry, by the distillation of nitre and oil of vitriol:

about two parts of nitre should be used to one part of oil of vitriol, and the retort heated in a sand-bath connected with a receiver kept cool by moistened cloths. This acid, thus obtained, is usually coloured, but becomes pale by exposure to air. If the nitre be dry, its specific gravity is from 1.52 to 1.55. This substance acts with great violence on all metals anciently known, excepting gold and platina, and it causes volatile oils to inflame. When it is passed through a porcelain tube heated to redness, oxygen is given off, and nitrous acid gas; and the same effect is produced upon the residual acid, as if it had been mixed with water; so that it is proved to be composed of nitrous acid gas, oxygen of water: and *four* in volume of nitrous gas, and two of oxygen gas condensed in water, I find absorb one in volume of oxygen to become nitric acid." He further adds, that from his own experiments, compared with those of Kirwan, Wenzel, and Berthollet, he thinks that the strongest acids contain from 14 to 15 *per cent.* of water, and, according to the principles of the French nomenclature, they ought to be called nitro-nitric acids. Aquafortis, or hydro-nitric acid, when its specific gravity is below 1.4, strengthens by being boiled: when stronger than 1.45, it becomes weaker by boiling.

The nitre of commerce frequently contains some muriatic salts, which being decomposed by the sulphuric, in common with the nitre, the muriatic acid comes over mixed with the nitric. If an excess of sulphuric acid be employed, and the heat be very great, the latter, more or less, is frequently distilled over, so that nitric acid is often contaminated with sulphuric and muriatic acids. The presence of the muriatic acid may be best avoided by carefully crystallizing the nitre to be employed. If at last it should still contain a little muriatic acid, it may be separated by nitrat of silver. The sulphuric acid may be separated by re-distilling from a litharge, or barytes sufficient to saturate all the sulphuric acid. After the nitrous gas has been expelled by heat, the acid may be deemed pure. In this state it is perfectly colourless, and of a strong acid taste, which, when diluted with water, is not unpleasant. It should be kept in a bottle coated on the outside with black varnish, or in a dark place. When it is exposed to the light, oxygen gas is disengaged, and the nitrous gas which is liberated tinges it of a yellow colour.

When exposed to the air it appears to exhale white fumes. This is occasioned by the great attraction of the acid for the moisture of the atmosphere.

To all animal substances it gives a beautiful yellow tinge.

The strongest acid yet produced is not of greater specific gravity than 1.62. Mr. Dalton informs us, that when its specific gravity is 1.42, it boils at 248° of Fahrenheit. If it be stronger, the acid is distilled off; and if weaker, the water, till it comes to the above maximum. It corrodes animal and vegetable substances very speedily, and the latter in the greatest degree. The yellow colour it gives to them, excepting substances containing albumen, is not produced but when the acid is very strong, and assisted by heat. If it be added to the essential oils, they speedily inflame, leaving behind a spongy coal. When it is poured upon powdered charcoal, very dry, it takes fire. The same effects take place with sulphur and phosphorus, at a certain temperature.

It is decomposed by all the metals, excepting gold, platina, and titanium: hence it is an important agent in chemistry for oxydating most of these substances. Many of the metals, such as zinc, iron, tin, &c. take the whole of the oxygen from it, while nitrogen alone is disengaged. Others of the metals, such as silver, mercury, copper, &c.

deprive it of only one atom of oxygen, the nitrous gas being set free, producing red fumes with the presence of oxygen. When it is poured on zinc, tin, or bismuth, in a state of fusion, inflammation takes place. The same effect takes place in the cold when the metals are in fine powder.

Nitric acid, as has been described, is not to be regarded as the real acid, but a compound of real acid and water. The determination of real acid, in a given quantity of the liquid, has much engaged the attention of chemists. We are indebted to Kirwan, Davy, Berthollet, and Dalton, for researches on this subject. The experiments of the first and last of these chemists appear to come nearest the truth.

Mr. Kirwan deprived some carbonat of soda of its water of crystallization: 367 grains of a solution of this salt contained 50.05 grains. This was saturated with 147 grains of nitric acid, of the specific gravity of 1.2754, equal, as he had ascertained, to 67.179 grains, of the specific gravity 1.5543, which he made his standard. The carbonic acid evolved by adding nitric acid was 14 grains. To this solution he added 939 grains of water, which reduced it to the specific gravity 1.0401, at the temperature of 58°.5, the whole solution weighing 1439 grains. He next prepared a solution of nitrat of soda, of the specific gravity of 1.0401, and found that the salt, in 1439 grains of this solution, was

$\frac{1}{16.901}$ of the whole; therefore $\frac{1439}{16.901} = 85.142$ grains of nitrat of soda. Now, the $50.05 - 14 = 36.05$ gr. is the weight of the alkali. The acid, therefore, will be $85.142 - 36.05 = 49.092$ grains; but the acid of 1.5543 weighed 67.179 grains; consequently $67.179 - 49.092 = 18.087$ will be the water contained in 67.179 of acid, of 1.5543 specific gravity, which is equal to 26.9 *per cent.* Hence 100 parts of nitric acid of 1.5543, consists of 73.1 of real acid, and 26.9 of water.

Dalton has made a number of similar experiments, which strongly confirm the conclusions of Kirwan, the greatest difference between them being no more than 1.4 *per cent.* in the quantity of real acid. The following is a table given by Dalton. The column of real acid is taken from Kirwan, with trifling corrections: in which he has also given a column for the quantity of real acid by measure, and another shewing the number of atoms of acid and water.

Atoms.	Acid <i>per cent.</i> by Measure.	Acid <i>per cent.</i> by Weight.	Specific Gravity.	Boiling Point.
Acid. Water.				
1 + 0	17.5	100	1.75	30°
2 + 1	13.4	82.7	1.62	100
1 + 1	11.2	72.5	1.54	175
	10.2	68.5	1.50	210
	84.7	58.4	1.45	240
1 + 2	77.2	54.4	1.42	248
	71.7	51.2	1.40	247
1 + 3	59.8	44.3	1.35	242
1 + 4	48.6	37.4	1.30	236
1 + 5	40.7	32.3	1.26	232
1 + 6	34.8	28.5	1.22	229
1 + 7	30.5	25.4	1.20	226
1 + 8	27.1	23	1.18	223
1 + 9	24.6	21	1.17	221
1 + 10	22.4	19.3	1.16	220
1 + 11	20.5	17.8	1.15	219
1 + 12	18.9	16.6	1.14	219

The first column of this table shews the number of atoms of acid and water, in which it appears, that when the compound is 1 atom of acid to 1 of water, the liquid acid contains 72.5 of real acid, and 27.5 of water by weight, and the same by measure will be 112 acid: this last is governed by the specific gravity, which is 1.54. The boiling point of this strength being at 175°, it will be seen that the maximum of the boiling point is at 248°; when the liquid acid consists of 1 atom of real acid to 2 of water, the specific gravity being 1.42, and the real acid 54.4 *per cent.* The acid, free from water, if its existence in the liquid form be possible, Mr. Dalton supposes would be as volatile as æther. It appears that the acid of 1.42 is the best strength to remain permanent, since, according to the experiments of this ingenious chemist, the acid and water are so nearly balanced in their affinities as to evaporate together. The acid or the water will therefore be apt to evaporate, as the real acid or water may be in excess above this point, which may be denominated the point of mutual saturation.

The acid of this strength has very curious properties, on which Dalton makes some ingenious observations. Proust has stated, that an acid of the strength of 1.48 gives no more effervescence with tin than it does with sand. When metals, which produce ammonia, are acted upon by nitric acid; these, I suppose, are such as decompose both the water and acid, taking all the oxygen from both. The metal, under this circumstance, combines with 3 atoms of oxygen, while the nitrogen and the hydrogen form ammonia. If the acid consisted of 1 of real acid to 2 of water, an atom of water would be set free, which would dilute the remaining acid, and thus facilitate the process. If, however, the acid and water were as 2 to 3, then an atom of nitric acid, and an atom of water, would be afforded to the atom of ammonia, forming an atom of nitrat of ammonia. The remaining acid and water would just be reduced to 1 of acid to 2 of water. At this point, and below it, effervescence would take place; but in the instance with 2 of acid to 3 of water, all the products will be disposed of in forming nitrat of ammonia, and reducing the acid to the strength of 1 of acid to 2 of water, during which change no effervescence will take place. This view of the subject is very ingenious, and fully explains the phenomena attendant on the oxidation of those metals which cause the formation of ammonia.

The acid of 1 of acid to 3 of water, has no striking properties. That which consists of 1 to 4, Mr. Dalton is of opinion, is that which freezes at -2° of Fahrenheit. Mr. Dalton, and previous to him, sir Humphrey Davy, have attempted to procure nitric acid in the gaseous form, by combining nitric oxyd (nitrous gas) with oxygen, but their results have not been attended with success. This appears to arise from the uncertainty in the combination of nitric oxyd gas with oxygen gas, especially when water is not present. It appears, from the experiments of Mr. Dalton, that nitric oxyd will combine with oxygen in any proportions between 1.3 and 3.6 of the oxyd to 1 of oxygen. This apparent anomaly to the doctrine of definite proportion is very ingeniously explained by the above-mentioned chemist. When the nitric oxyd is to oxygen as 3.6 to 1, the oxygen combines with one-half of the nitric oxyd, forming nitric acid, which combines afterwards with the other half to form nitrous acid, or the fuming and coloured nitric acid. When, on the other hand, 1 of oxygen combines with 1.3 of nitrous oxyd, in which the minimum of the latter exists, a compound is formed, which, according to the opinion of Mr. Dalton, consists of 1 atom of nitrogen with

3 of oxygen, and which he has denominated the oxynitric acid. The first of these combinations is favoured by using a vessel which gives a short column of great diameter, and in which the change is quick. The second combination, in which the oxygen is in excess, is facilitated by the change being slow, which is effected by using a long tube of small diameter. A tube of an intermediate size being employed when the gases are 1 of oxygen to 1.8 of nitric oxyd by measure, the nitric acid will be formed by the union of the two gases. It is the opinion of this distinguished chemist, that if the gases, even in exact proportions to form nitric acid, be mixed in a dry vessel, that all the compounds, namely, nitrous acid, nitric acid, and oxynitric acid, may exist, which, when water is introduced, may so act upon each other, as to form nitric acid. These facts, with the reasoning resulting from the same, seem to baffle all attempts to obtain nitric acid in a free state. Mr. Dalton, after much care and attention, has given the means to determine the component parts of the nitric acid. If, as he seems fully to have established, the atom of nitrogen be 5, and the acid be constituted by 1 atom of nitrogen to 2 of oxygen, the proportions will be 14 of oxygen to 5 of nitrogen, and the weight of the atom of acid will be 19. For the colouring of fuming nitric acid, see *NITROUS Acid*; see also *NITRIC Oxyd*, and *NITROUS Oxyd*. The combinations of nitric acid with the different saline bases, are called *nitrats*.

NITRIC, and *NITROUS Acid*, in the *Materia Medica*. The *nitric* acid of the London Pharmacopeia is prepared by mixing *nitrat* of potash dried and sulphuric acid, of each two pounds, in a glass retort; and distilling the nitric acid from a sand-bath, until red vapours are produced; then add an ounce of dried nitrat of potash, and re-distil the acid in a similar manner. The specific gravity of this acid is to that of distilled water as 1.500 to 1.000. If a piece of lime-stone be immersed in a fluid-ounce of it diluted with water, seven drams ought to be dissolved. According to the directions of the Edinburgh Pharmacopeia, any quantity of nitrous acid is put into a retort, and having fitted a receiver, a very gentle heat is applied until the reddest part shall have passed over, and the acid which remains in the retort have become nitric acid. The *nitrous* acid of the Edinburgh Pharmacopeia is prepared by pouring sixteen ounces of sulphuric acid upon two pounds of bruised nitrat of potash in a glass retort, and distilling from a sand-bath, with a gradually augmented heat, until the iron pot becomes obscurely red-hot. The specific gravity of this acid is to that of distilled water as 1.550 to 1.000. The Dublin Pharmacopeia orders six pounds of nitrat of kali to be mixed with four pounds by weight of sulphuric acid, and then distilled until the residue becomes dry. The specific gravity of this acid is to that of distilled water as 1.500 to 1.000.

In performing these operations, it is advisable to use Woulfe's apparatus, or a range of two or three globular receivers, the last of which should contain a small portion of water. In order to prevent the nitrous oxyd from combining with the condensed acid in the receiver, deepening its colour, and giving it that form which constitutes nitrous acid, the London College orders a large portion of sulphuric acid to be employed, which serves to contribute a sufficient portion of water for preserving the constitution of the nitric acid; for, although a large proportion of this acid be obtained by following the directions of the London formula, yet it is actually weaker than that which is obtained either by the Edinburgh or the Dublin processes. The Edinburgh College orders the acid to be kept in this form; and as a medical agent it answers the same purposes as the colourless acid; for, when both are diluted with water, they have the

the same appearance, and are brought to the same state, the addition of the water expelling completely the nitrous oxyd, which is loosely united with the nitric acid to form the nitrous. The quantity of acid obtained is about half the weight of the nitrat employed: and the residue is a white, spongy, saline cake of sulphat of potash, with an excess of sulphuric acid, which may be dissolved out of the retort by hot water. By the London process, the nitric acid is at first obtained tolerably free from nitrous oxyd; but in general the re-distillation will be found necessary. In the expulsion of the nitric oxyd, to change the nitrous into nitric acid, according to the directions of the Edinburgh College, a portion of the acid is carried over with the gas, as nitrous acid vapour: this should not be wasted, but be condensed by a small portion of water being put into the receiver, and thus form a diluted acid. Mr. Murray (Mat. Med.) justly observes, that the heat of a water-bath is best adapted for this operation, being sufficient for the purpose, and not too high to produce the decomposition of the acid. A completely colourless acid, however, is not obtained, unless the acid be re-distilled from a small portion of black oxyd of manganese; but this is not necessary for medical purposes. The contaminations of nitric acid by muriatic or sulphuric acid do not affect its medicinal virtues.

Nitrous acid, as the term is understood in the Edinburgh Pharmacopeia, is a yellow or orange-coloured fluid, emitting, when exposed to the air, deep orange-coloured extremely suffocating fumes. With regard to its chemical affinities and other qualities, it agrees in every respect with nitric acid. It consists of nitric oxyd loosely combined with nitric acid and water.

Nitric acid is a colourless, or very pale yellow, limpid fluid, emitting, when exposed to the air, white suffocating vapours, and possessing strong acid properties. It is highly corrosive, and tinges the skin yellow, which remains till the epidermis is peeled off. It unites with water in every proportion, and while mixing heat is evolved. See the articles *NITRIC* and *NITROUS Acid*, supra.

Strong fluid nitric acid is used only for pharmaceutical purposes; except when extricated in the form of vapour, it is employed for destroying contagion. It is less powerful than the oxymuriatic acid, but is more generally useful, as it can be extricated in the chambers of the sick without proving deleterious to animal life. For this purpose, f3ij of sulphuric acid may be poured over 3iv of coarsely powdered nitre in a china cup, and placed in a pipkin of hot sand. This quantity is sufficient for fumigating a room that is ten feet square; and where a larger portion is required, it is more advisable to multiply the number of pipkins than to put a larger quantity of the materials into one vessel. The official preparations of nitric acid are the following, *viz.* *Acidum nitricum dilutum*, L. E. D.; *Oxydum antimonii*, L.; *Argenti nitras*, L. D.; *Liquor ferri alkalini*, L.; *Ung. hydrargyri nitratis*, L. E. D.; *Hydrargyri nitricum oxydum*, L.; *Spiritus ætheris nitrici*, L. E. D.; *Unguentum acidi nitrosi*, E. D.

The diluted nitric acid, L., is prepared by mixing a fluid-ounce of nitric acid with nine fluid-ounces of distilled water. For that of E. take equal weights of nitrous acid and mix them, avoiding the noxious vapours. For that of D. take of nitrous acid and distilled water of each one pound. The specific gravity of this mixture is to that of distilled water as 1280 to 1000. When the diluted acid is prepared according to the directions of the London College, f3i contains about grs. x of nitric acid, of 1.500 specific gravity, while the same measure of the

same acid, prepared after the Edinburgh and Dublin, and the former London formulæ, contains grs. xxxv of the same acid; a difference, which, as it may lead to errors in practice, is to be regretted.

Nitric acid is tonic and antiseptic. When largely diluted with water, it forms an agreeable and useful beverage in fevers, particularly of the typhoid type. In larger doses, less diluted, it has been administered with effect in chronic hepatitis, even when dropsy has supervened; and it has also been serviceable in restraining violent sickness, in dyspepsia, asthma, and the greater number of cachexiæ. From observations of Mr. Scott, published at Bombay in 1796, this acid excited attention as a remedy for syphilis; but after the most ample trials, by almost every practitioner of eminence in the country, its antisyphilitic powers have not been found to correspond to the accounts of those transmitted from India. Although it gives a temporary check to the progress of the disease, it does not permanently remove the symptoms; and, as Mr. Pearson justly observes, it would by no means be warrantable to substitute the nitrous (or nitric) acid in the place of mercury, for the cure of venereal complaints. It has been found, however, of considerable service when given at the same time with mercury, in old obstinate ulcerations of the legs, although no venereal taint could be suspected; and it is employed with benefit as a local stimulant in the form of lotion, in the proportion of f3ij of the acid to oj of water, for fœtid ulcers, attended with a thin ichorous discharge, and in caries of the bones. In India it is sometimes used in the form of a bath, and in this state produces the same effects as when it is taken internally. The dose of the diluted acid is from m x to m xxx in f3iij of water, given three or four times a day. Its official preparations are, *Aceti hydrargyri*, E. D.; *Submuriæ hydrargyri præcipitatus*, E. D.; *Submuriæ hydrargyri ammoniatus*, D.; *Oxydum hydrargyri cinereum*, E. D.; *Oxydum hydrargyri rubrum*, E. D. See *MERCURY*. Thomson's Lond. Dispensatory, 1811.

NITRIC Oxyd, in *Chemistry*. This substance, like the nitric acid, is a compound of nitrogen with oxygen: the former being formed of 1 atom of nitrogen to 2 of oxygen, the latter 1 to 1.

Several of the metals, as silver, mercury, and copper, when added to the nitric acid, deprive it of 1 atom of oxygen only. The remainder, which is 1 to 1, escapes in the form of gas. This gas has been formerly called nitrous gas; but, according to the present state of chemical nomenclature, it is called nitric oxyd.

To procure nitric oxyd, introduce small bits of copper into a gas bottle, or a small retort, upon which pour nitric acid of the specific gravity 1.2. Let the process go on a little, the mouth of the retort being under water, or mercury, before the gas is collected. This serves to displace the air of the retort. The gas, which is now obtained, will be colourless as common air. In this process, an atom of copper decomposes two atoms of nitric acid, taking an atom from each to form the second oxyd of copper. This oxyd then combines with two other atoms of acid, to form nitrat of copper. The two atoms of nitric oxyd, resulting from the decomposed acid, would be absorbed by the remaining acid, if a sufficient quantity were present; by which it would acquire, first, a yellow colour; a deep orange, as it increases; next, a green; and ultimately, a blueish tint. For the better observance of these shades of colour, silver should be employed instead of copper; since the solutions of copper in any acid are of green colour. When, however, the excess of acid is not great in producing nitric oxyd, a great proportion of this gas is evolved. For common purposes,

poses, it may be collected over water, which absorbs only about $\frac{1}{20}$ th of its bulk: on some occasions, however, it is necessary to collect it over mercury.

Nitric oxyd may be separated from other gases, by means of solutions of iron with the black oxyd. The liquid, by agitation, soon absorbs all the nitric oxyd, without affecting any other gas that might exist with it. This furnishes an easy method of ascertaining the purity of nitric oxyd. The absorbed gas may be separated unchanged by heat.

When the nitric oxyd is mixed with oxygen, or is brought in contact with the atmosphere, red fumes immediately appear, which are of greater density than common air. This is called nitrous acid gas.

The specific gravity of nitric oxyd is to common air, according to Kirwan, as 1 to 1.19; but Davy, who is nearer the truth, makes it 1.102. If hydrogen be equal to 1, and 100 cubic inches weigh 2.5 grains, then the nitric oxyd will be 13, and 100 cubic inches of it will weigh 32.5 grains.

When a lighted taper, or sulphur in a state of inflammation, are immersed in this gas, the flame becomes extinguished; but phosphorus and charcoal, when once kindled, burn in it, and consequently deprive it of its oxygen.

Several of the metals, such as arsenic and zinc, when heated in this gas, deprive it of its oxygen; the residual gas being nitrogen.

Other bodies take away only part of its oxygen: of these are the alkaline sulphurets, the muriatic solution of tin, and several of the sulphats. For these facts we are indebted to sir Humphrey Davy. The resulting gas is the nitrous oxyd, which is composed, according to Dalton, of one atom of oxygen to two of nitrogen. In this process, an atom of nitric oxyd gas gives up an atom of oxygen, which combines with the decomposing body; while the deserted atom of nitrogen combines with an atom of nitrous gas, forming nitrous oxyd. This most clearly shews why the atom of nitrous oxyd should be heavier than an atom of nitric oxyd. The latter atom is constituted by 1 to 1 = 5 + 7 = 12; the former of 1 of oxygen to 2 of nitrogen, or 7 + 2 \times 5 = 17. Sir Humphrey Davy, notwithstanding this corroborating fact, considers nitrous oxyd as 1 of oxygen to 1 of nitrogen; by doing which, the nitric acid is made to consist of 1 of nitrogen to 5 of oxygen; a thing very improbable between two bodies having so little affinity for each other.

When nitric oxyd is acted upon by electricity, an atom of oxygen is liberated from one atom of the gas, and given to another, till the whole is divided into nitric acid and nitrogen. In other words, one-half of the gas gives its oxygen to the other half. By this change, if the original

volume be 1, the resulting volume will be $\frac{1}{2} \times \frac{13}{12.125} =$

$\frac{13}{24\frac{1}{2}}$, a little more than half.

When nitric oxyd is mixed with hydrogen, it does not explode by the electric spark. It is, however, said to detonate, when passed through a red-hot porcelain tube; the result being water and nitrogen. The relative volume of these gases, to produce this result, will be 13 of hydrogen and 12 of nitrogen.

We are indebted to Dr. Henry for the fact of nitric oxyd being decomposed by ammonia. For this purpose, the two gases are to be put into the strong tube, called Volta's eudiometer, and the electric spark passed through them. When the nitric oxyd is in excess, the result is nitrogen, water,

and a little nitric acid; when the ammonia predominates, then nitrogen, water, and hydrogen are produced.

From the great facility with which the nitric oxyd combines with oxygen, it has been employed to ascertain the quantity of oxygen mixed with other gases. There is, however, some uncertainty in this method, in consequence of several compounds being formed by oxygen and nitric oxyd. Dalton recommends an excess of the latter to be used, in order to prevent the ambiguity above mentioned, and afterwards to take up the excess with a solution of the green sulphat of iron.

When nitric oxyd is mixed with oxymuriatic acid gas, a sudden decrease of volume takes place, from the muriatic acid and nitric acid being formed, both of which become liquid. This effect, however, does not take place, if the gases be perfectly dry, and the vessels free from moisture.

Since an atom of nitric oxyd consists of 1 of nitrogen to 1 of oxygen, the weight of its atom will be 5 + 7 = 12; the nitric acid, being 1 of nitrogen to 2 of oxygen, will be 5 + 2 \times 7 = 17: hence the proportions of oxygen and nitric oxyd to form nitric acid will be 7 to 12. In mixing this with other gases, where mutual action takes place, the proportion by weight will be as the weights of their atoms. Their proportions by volume will be obtained, by multiplying the ratio of their weights by the united ratio of their specific gravities: the latter ratio will be easily expressed, by making the specific gravity of hydrogen gas unity. If, for instance, nitric oxyd be mixed with hydrogen, to be passed through a red-hot porcelain tube, the proportion by weight will be 12 of the oxyd to 1 of hydrogen, the re-

lative weights of their atoms, and $\frac{12}{1} \times \frac{1}{13} = \frac{12}{13}$, or 12

of nitric oxyd by measure to 13 of hydrogen. Ammonia

and nitric oxyd will be $\frac{6}{12} \times \frac{13}{7.5} = \frac{13}{15}$, or 13 by volume of ammonia to 15 of nitric acid.

NITRO-AERIAL SPIRIT, a term invented by Mayow, and since used by many others, to express a very active principle in the air, causing great changes in the bodies absorbing it, and exposed to it. This acid spirit is, according to Mayow, composed of terrene matter, which is flexible and humid, and of ethereal particles, which are rigid and dry, active and igneous, and proceeding from the air. These igneous particles are common to nitre and to air, and are therefore called *nitro-aerial*; and the spirit of nitre derives, according to this system, from these particles its active and corrosive quality, which makes it a sort of potential fire; and on this the form of nitre chiefly, if not wholly, depends.

NITROGEN, in *Chemistry*, a simple oxydable body, by some chemists called azot, from its property of destroying life. This name appears improper, since several other gases have the same effect upon animals.

Before the discovery of Cavendish, our knowledge of this gas was little more than negative. It was then believed to be the base of the nitric acid, but the certainty was not established till the gas was combined with oxygen, by passing a number of electric sparks through the two gases. This is the only positive knowledge we yet possess of this substance. Its specific gravity is 12 $\frac{1}{2}$, hydrogen being 1. The weight of its atom is 5, hydrogen being 1. See AZOT.

NITRO-MURIATIC ACID. This acid is formed by mixing the nitric and muriatic acids together, or by dissolv-

ing muriatic acid in nitric acid. In the latter process part of the nitric acid decomposes the salt, while the other part acts upon the disengaged muriatic acid, to form the nitro-muriatic acid. This acid was known to the ancients, who called it *aqua regia*, from its property of dissolving gold. It is now pretty generally admitted to be oxymuriatic acid, formed by the oxygen of the nitric acid with the muriatic acid. Hence we may infer, that the proportions of these acids should be as the weight of the atoms of real acid, which is 22 of muriatic acid to 19 of the nitric: the latter gives an atom of oxygen to the former, forming oxymuriatic acid, which will be 29, while 12 of nitric oxyd will be partly evolved, but is more generally retained by the liquid, to which it gives an orange colour.

This is by far the most convenient menstruum for gold and platina, and is used in the arts for that purpose. See *OXYMURIATIC Acid*.

NITROUS ACID. This name has been commonly given to the nitric acid when rendered fuming by the presence of nitric oxyd. Since, however, nitric acid may contain almost any proportion of nitric oxyd, we cannot with propriety admit this mixture as nitrous acid. Dalton is of opinion that nitric acid and nitric oxyd may unite in such proportions as to form a compound, to which he has given the name of nitrous acid. In order to obtain pure nitrous acid, this chemist recommends water to be first impregnated with oxygen gas, and then with nitric oxyd. By this means 2 atoms of nitric oxyd unite with 1 of oxygen, forming nitrous acid. Since, as we have observed under *NITRIC Oxyd*, that nitric acid is 1 of nitric oxyd to 1 of oxygen, nitrous acid must, therefore, consist of 1 atom of nitric acid, united to 1 of nitric oxyd, and its atom will be, therefore, $12 + 19 = 31$.

Mr. Dalton supposes that the common fuming acid is generally a compound of nitrous acid and nitric acid. He obtained an acid by saturating nitric acid of 1.3 with nitric oxyd gas, which boiled at 160° , while the same acid, without the gas, boiled at 236° . Hence he concludes that the nitrous acid is formed in the first instance, and gives the increased volatility to the nitric acid.

The existence of an acid, containing less oxygen than the nitric acid, has been inferred from the fact of exposing nitrat of potash to a certain degree of heat, by which a portion of oxygen gas is driven off. The salt, however, is still neutral, a proof that the remaining acid was still capable of saturating the alkali. Hence it has been supposed, that nitric acid has parted with so much of its oxygen as to leave nitrous acid, and that the salt is converted from a nitrat into a nitrite. In this experiment an atom of oxygen is disengaged from an atom of nitric acid, leaving an atom of nitrous oxyd, which combining with another atom of nitric acid, forms an atom of nitrous acid, so that the result is half as many atoms of the latter, as there were of the nitric acid. The salt originally consisted of 1 atom of potash combined with 2 atoms of nitric acid, while the resulting salt consists of 1 atom of nitrous acid, combined with 1 of alkali.

NITROUS Gas. See *EUDIOMETRY and Gas*.

NITROUS Oxyd. In referring to *NITRIC Oxyd*, it will be found that it is composed of 1 atom of nitrogen and 1 of oxygen. This is a compound of the same elements, but with less oxygen. In the sequel it will appear that nitrous oxyd is formed of 2 atoms of nitrogen with 1 of oxygen, being, therefore, a heavier atom than nitric oxyd as 17 to 12. The following is the process for procuring this gas in a state of purity. Into a glass retort put as much crystallized nitrat of ammonia as will half fill it when fused: place the re-

tort over a lamp, capable of giving a degree of heat equal to 400° , and let the neck of the retort be connected with a pneumatic trough. After the salt has fused, and the water of crystallization driven off, the heat requires to be raised to between 3 and 400° of Fahrenheit. Numerous bubbles will soon appear on the surface of the fluid, much more brilliant than those previously observed from the boiling of the liquid. It is under this appearance that the salt is decomposed, and the nitrous oxyd evolved. This decomposition will go on till the retort is quite empty, the whole of the nitrat of ammonia being converted into water and the gas in question. It will be proper to observe, that the retort must be removed the instant the last portion of salt is decomposed, to prevent the water of the vessel coming into it by the pressure of the atmosphere. If the gas be received over water, a quantity of gas, equal to the volume of the water, will be absorbed. Hence, for any nice experiments, it should be received over mercury. Nitrous oxyd has all the mechanical properties of common air, with respect to transparency, colour, and elasticity. Its specific gravity is 20, hydrogen being 1, and the weight of 100 cubic inches is equal to 50 grains. Its constitution will be easily seen from its formation, in the process above described. Nitrat of ammonia is constituted by an atom of nitric acid, an atom of ammonia, and 1 of water. When the salt is decomposed, the 2 atoms of nitrogen, 1 from the acid, and the other from the ammonia, jointly combine with 1 atom of oxygen from the acid, forming nitrous oxyd, while the other atom of the oxygen from the acid combines with the hydrogen of the ammonia, forming water. This agrees with the fact, since nitrat of ammonia produces nothing but water and nitrous oxyd. Nitrat of ammonia, according to sir Humphrey Davy's numbers, consists of 1 proportion of acid and 5 proportions of oxygen for the acid, and 1 of nitrogen to 6 of hydrogen for the ammonia. The 2 proportions of nitrogen retain, each, a proportion of oxygen, forming 2 of nitrous oxyd, while the other 3 of oxygen combine with 6 proportions of hydrogen, forming 3 of water. This equally explains the fact, but does not possess the simplicity of Dalton's numbers for the weight of atoms. It is not less irreconcilable, that 1 of nitrogen should combine with 6 of hydrogen, than 1 of nitrogen combining with 5 of oxygen to form nitric acid.

Although the nitrous oxyd contains less oxygen than nitric oxyd, yet the former supports combustion with most bodies; while the latter, as has been observed under that article, is scarcely susceptible of this property. If sulphur be first kindled, and then introduced into nitrous oxyd, it burns with a brilliant rose-coloured flame, producing sulphuric acid and nitrogen gas.

Phosphorus, similarly treated, burns with great violence.

Carbon exposed in this gas, and fired by a lens in the sun's heat, burns with great brilliancy, producing carbonic acid and nitrogen gas. According to Priestley it is capable of detonation with hydrogen, by the electric spark producing water and nitrogen. When the hydrogen is not sufficient, nitric acid is said to be formed. This latter fact appears very improbable.

It is also decomposed by sulphuretted, phosphuretted, and carburetted hydrogen gases, by applying the mixtures to a strong heat.

Iron wire burns in this gas equally well with oxygen, but with less duration, producing the black oxyd of iron. It is decomposed by zinc, the nitrogen being left, while the zinc is oxydated.

oxydated. It is said to combine with potash and soda, forming peculiar compounds.

Dr. Priestley, who discovered this gas in 1776, declares it unrespirable, and the Dutch chemists, who afterwards examined it, coincide with him in this opinion. We are indebted to sir Humphrey Davy for many additional facts relative to it, among which he found that, to a certain extent, it is respirable, under which it produces effects on the system not much unlike intoxication: these effects are, however, very different on different subjects, and according to the time it is breathed. Some become highly exhilarated, exhibiting unusual motions and gestures, with incoherent language, and at the same time unconscious of all around them. On returning consciousness, they describe some extravagant scene, which they relate as a dream, but in which the impressions have been more vivid. Others are very differently affected, appearing almost in a state of insensibility. The countenance appears as in a state of paralysis, and of a livid and purple colour. They will sit motionless for some time, and when they recover have no lively dream to repeat. Almost all who breathe it effectually, become unconscious in a few minutes, and breathe the gas involuntarily for some time afterwards. During the rage for gaseous medicine, it was held up as promising great advantage in certain diseases. This idea has been some time abandoned, with little hope of its revival.

NITRUM is used by the poet Martial to express that sort of foulness in crystal, which Pliny, and others of the ancient Roman authors, distinguished by the name of *sal*.

NITRUM *Calcareum*, in *Natural History*, a name given by Dr. Lister to a peculiar species of neutral salt, which he first publicly described in his book on the medicinal waters of England. He very improperly calls it nitre; because it has none of the properties or qualities of nitre, but only a sort of general resemblance in its external form. He observes that this salt, though very little known, was abundantly the most copious of all the sorts afforded by the mineral waters in general; and says its crystals were long and slender, and consisted of four sides, and were terminated by a point composed of two triangular planes. He adds, that this salt doubtless had its origin from a mixture of the acid of sulphur and a calcareous earth of an alkaline nature.

This salt is found in almost all the mineral waters of Germany, and is very justly observed by Hoffmann to be of the nature of Glauber's salt: that it is not nitre is evident from this, that it is not inflammable, nor will yield aquafortis by distillation. It seems, indeed, true Glauber's salt, composed of the acid of vitriol, or sulphur, for this is in both the same, and of that alkaline earth which is the basis of sea-salt: this is its origin, in the vessels of the chemist, as well as in the bowels of the earth, and probably the figure of the crystals of that observed by Dr. Lister, was the same in the point, as well as in the body, both being quadrilateral columns terminated by pyramids composed of a number of triangular planes. Hoffmann, *Opera*, tom. v. p. 139.

The medicinal waters in the neighbourhood of Paris contain it also in a very considerable quantity, though less than this. It is the opinion of Hoffmann, that when any water before impregnated with a vitriolic acid, in its current under ground, passes over this calcareous earth, it as readily joins a part of it with it, as the vitriolic acid does with the sea-salt, for its basis, in making the common Glauber's salt, and thence produces a bitter purging salt, of the same nature with that; and, indeed, if the acid of sulphur

be mixed with any alkaline substance, a bitter neutral salt is produced, somewhat analogous to this, and to the Glauber's salt.

NITRUM *Nitratum*, in *Chemistry*, the name of a preparation of nitre, made by adding a sufficient quantity of spirit of nitre to a lixivium of pure nitre, and afterwards evaporating it to a pellicle, and setting it by to shoot. The crystals formed by this liquor are perfectly nitrous in their figure, but they will be of an acid taste.

This preparation of nitre is a good medicine in burning fevers.

NITRUM *Purificatum*, *purified nitre*, is thus prepared: take nitre, or common saltpetre, one pound; pure water three quarts and a pint, set them on the fire together, and dissolve the salt perfectly by boiling: then strain the hot lixivium through a double flannel, and set it over the fire again in an earthen vessel. Evaporate it gently, till on taking out a little of the liquor in a spoon as it cools, there are seen threads as it were shooting in it; in this state the salt is ready to concreate. Set it in a cool place, putting clean sticks across the vessel, and the salt will form itself into extremely pure and beautiful crystals on the side of the vessel, but principally on the sticks. These dried in a colander are fit for use. See *Nitrat of POTASH*.

This is the best of all the preparations of nitre, for medicinal use, in its native form. It dissolves immediately on entering the body, where it wonderfully cools, and thins the blood, giving it a fine florid colour. In all inflammatory diseases attended with condensations of the blood, this salt proves excellently cooling and attenuating. It is given from four or five grains, to ten, twelve, or fifteen at a dose. Some give more at a time, but it is more advisable to have the doses smaller, and oftener repeated. It is also good in the small-pox, and suppressions of urine. It is also said to be given by many in hæmorrhages with success. If there be any case in which caution is required, it is in a consumption where the lungs are ulcerated. Of this purified nitre, a safe and powerful alterant is readily and easily prepared in the following manner: take an ounce of the nitre, and two scruples of cochineal, in fine powder; boil these in five or six ounces of water; filter the liquor, and afterwards evaporate it to a dryness, stirring it continually as it thickens, and a fine purple powder will be then produced, fit to be given in the form of bolus, pills, powder, &c.

NITRUM *Vegetans*, a name given by the chemists to a preparation of nitre, which very readily shoots out into beautiful crystallizations. If, in making Glauber's spirit of nitre, there are used four parts of nitre, and one of oil of vitriol, and the spirit be entirely driven off, the white salt remaining dry in the retort, on being exposed to the open air, will soon be covered with a thick and long down, as if it grew; but if this salt be dissolved in water, and then strained, and evaporated to a dryness, in a cylindrical glass, and kept exposed to the open air, its upper surface will often appear covered with beautiful branching little plants, all which will dissolve away upon the application of heat, and leave the surface even; but upon exposing the vessel again to the open air, in a quiet place, they will grow again as before, thus several times exhibiting the resuscitation of plants, as it were from their own ashes.

Some chemists have formed several fables upon some such basis as this; and very probably the whole secret of their operations was no more than a concealed fraud of this kind, this having nothing to do with vegetation.

NITRUM *Vitriolatum*, a preparation of nitre made as follows: dissolve the mass left in the retort after distillation of a spirit of nitre, in about eight times its weight of water; I
filtrate

filtrate the solution, and when perfectly clear, evaporate the liquor to such a standard, that the salt will no longer be sustained in it; then set it in a cool place, and collect the salt as it floats, laying it in an earthen colander to dry. This is of much the same virtues with tartar vitriolated, and is frequently sold under its name.

NITTA, in *Geography*, a town of Japan, in the island of Nippon; 50 miles N.N.W. of Jedo.

NITTANY, a mountain of Pennsylvania, between the Juniatte and the W. branch of Susquehannah river.

NITTENAU, a town of Bavaria, on the Regen; 15 miles N.N.E. of Ratibon.

NITTLES, in *Sea Language*. See **KNITTLES**.

NIVALIS, in *Ornithology*. See **EMBERIZA Nivalis**.

NIVARIA, in *Ancient Geography*, a town of Spain, on the route from Emerita to Cæsarea Augusta, according to the Itinerary of Antonine, between Septimonia and Cauca; 22 miles from the former, and at the same distance from the latter.

NIVELLE, DE LA CHAUSSÉE PETER CLAUDE, in *Biography*, a dramatic writer, was born at Paris in 1692, of an ancient and respectable family. He was educated chiefly at the Jesuits' college, and studied rhetoric and philosophy at Plessis. His uncle was high in office, and could have introduced the young man into situations that would have led to wealth, respectability, and honour, but he had no desire of the great things of this world, and chose rather to indulge his taste for literature. His first publication was "Épître de Clio à M. de Beréy," in which he attacked his friend La Motte's system of prose-poetry. This poem was highly applauded; and being urged by his friends to turn his thoughts to dramatic compositions, he produced a comedy, entitled "La Fausse Antipathie." This piece was sufficiently successful to encourage him to proceed, and his next comedy, "Le Préjugé à la Mode," was received with an applause that surpassed his most sanguine expectations. This was followed by "L'Ecole des Amis," and by the tragedy of "Maximian." His reputation gained him an admission into the French Academy, but at the same time it excited against him the envy and jealousy of his contemporaries. He therefore chose to bring out his next comedy of "Melanide," as the work of an unknown author. By this artifice he eluded opposition, and obtained a success equal to the merits of his performance, which is reckoned his master-piece. His biographer says, that the "Ecole des Méres" is by some preferred to it, and that his "Gouvernante" is the favourite with others. Of all these works, the peculiar characteristics are, according to D'Alembert, that they form a school of morals: that they breathe an ardent spirit of virtue, and inspire the love of it. Piron, jealous of the success of the "Melanide," ridiculed the moral strains of its author, and jeeringly asked a friend who was going to the performance, if "he was intending to hear father La Chaussée preach." This jest was not forgotten; and Nivelle, though a man of amiable dispositions, opposed the election of Piron when he was a candidate for a seat in the Academy. He tried his powers in other departments of the drama, and composed a kind of romantic pastoral, entitled "Amour pour Amour," and several other farces and pieces of low humour. His celebrity is, however, chiefly founded upon his grave comedies, for in the single tragedy which he attempted, he failed. He died in 1754, at the age of 62. His theatrical works were published at Paris in five volumes, 12mo. 1763.

NIVELLE, GABRIEL NICHOLAS, was born at Paris about the year 1687. Feeling an early inclination to retirement and study, he entered the seminary of St. Magloire, belonging

to the congregation of the Oratory, where he continued till that community was dispersed in 1723. After this he was nominated prior commendatory of St. Geréon, in the diocese of Nantes. In the year 1730, he was imprisoned for four months in the Bastille, on account of his opposition to the bull Unigenitus. He died in 1761, at the age of 74. He is principally known by a work entitled "An Account of the Proceedings in the Faculty of Theology at Paris, on the Subject of the Constitution Unigenitus," in seven volumes 12mo, and some other pieces connected with the same subject.

NIVELLES, in *Geography*, a town of France, and principal place of a district, in the department of the Dyle, formerly capital of Wallon Brabant, to which belonged the privilege of coining money; 15 miles S. of Brussels. It is divided into two parts, one containing 3230 inhabitants, and its canton 9324, on a territory of 145 kilometres, in 10 communes, and the other, comprehending 3307 inhabitants, and its canton 11,005, on a territory of 100 kilometres, in 11 communes.

NIVERNOIS, LOUIS-JULES MANCINI, Duke of, in *Biography*, was born at Paris in 1716. He was brought up to the military service, and after he had served in the army some time, he was nominated ambassador to Rome, and then to Berlin, where he made himself very acceptable to the great Frederic. In 1763 he was entrusted with the important negotiation of the definitive treaty of peace at London. In every concern of this kind, in which he was engaged, he maintained the character of a prudent and enlightened minister, who united amenity of manners with the dignity of his station. After his return to Paris he devoted himself entirely to letters, and by some publications he obtained an admission into the French Academy, and that of inscriptions. This worthy and excellent man lived to be a sufferer from the revolution, and was committed to prison during the tyranny of Robespierre, but fortunately escaped the guillotine, and when that blood-thirsty wretch paid the forfeit of his crimes, Nivernois was released. He died in 1798, at the age of eighty-two. His works were published collectively in eight volumes not long before his death.

NIVERNOIS, in *Geography*, a province of France before the revolution, the capital of which was Nevers. This province, which lies between 46° 45' and 47° 35' N. lat., and between 2° 55' and 4° E. long., is of an oval form, tolerably fertile, and yielding grain, wine, fruits, and pasture. It contains pit-coal, iron mines, and mineral springs. Three of its rivers are navigable, viz. the Loire, the Allier, and the Yonne. It is now the department of the *Nyèvre*, which see.

NIVERNOIS Bay, a large bay at the eastern extremity of lake Ontario.

NIVERS, in *Biography, music-master and organist of St. Sulpice at Paris, published, in 1667, a treatise on composition, and many other works on chanting, plain-chant, le chant Gregorien, &c. And when the syllable *fi* was first proposed for the 7th of the key of C natural, he wrote a book on the gammut of *fi*, and an elementary tract, called "Musique des Enfants," together with twelve books for the organ. Laborde.*

NIVILLE, in *Geography*, a town of France, in the department of the Oise, and chief place of a canton, in the district of Beauvais. The place contains 131, and the canton 9854 inhabitants, on a territory of 202½ kilometres, in 22 communes.

NIUKCHEVSKOI, a town of Russia, in the province of Usting, on the Sula; 24 miles S. of Ust Silolsk.

NIURUNDA, a town of Sweden, in the province of Medelpada;

Medelpadia; 10 miles S. of Sundfwall.—Alfo, a river of Sweden, which rifes in the province of Harjeadalen, bearing the name of “Liunga,” till it arrives at Hufro, in the province of Medelpadia: here it changes its name, and after croffing the province, runs into the gulf of Bothnia, five miles S. of Sundfwall.

NIWA, a town of Sweden, in Weft Bothnia, fituated on the Tornea; 16 miles N. of Tornea.

NIXONTON, a poft-town of America, in North Carolina, and capital of Pasquotank county, containing a court-houfe, gaol, and a few dwelling-houfes; 28 miles N.E. of Edenton.

NIZA, a town of Portugal, in the province of Alentejo; 15 miles N.N.W. of Portalegre.

NIZAMBADDA, a town of Hindooftan, in the circar of Cicacole; 10 miles N.E. of Cicacole.

NIZAMPATAM, a town of Hindooftan, in the circar of Guntoor, at one of the mouths of the river Kiftnah, on the coaft of the bay of Bengal; 34 miles S.W. of Masulipatam. N. lat. $15^{\circ} 55'$. E. long. $80^{\circ} 48'$.

NIZAMPET, a town of Hindooftan, in the circar of Aurungabad; 15 miles W. of Aurungabad.

NIZAO, a river of Hifpaniola, which runs into the fea, three miles E. of cape Nizao.

NIZGORODSKOE, a province of Ruffia, bounded on the N. by Koftromskoe, on the W. by Vladimir and Tambov, on the S. by Penzenfkoe, and on the E. by Kazan and Simbirfk; about 160 miles long, and 100 broad. The capital is Niznei Novogorod. N. lat. $54^{\circ} 10'$ to 57° . E. long. 42° to 46° .

NIZNOTOSMANSKOI, a town of Ruffia, in the government of Archangel, on the Dwina; 48 miles E. of Schenkurfk.

NIZZA *de la Paglia*, a town of France, in the department of the Tanaro, on the river Belbo; 7 miles N.W. of Acqui. N. lat. $44^{\circ} 48'$. E. long. $8^{\circ} 28'$.

NIZZOLI, MARIO, in *Biography*, an elegant fcholar of the fixteenth century, was born at Brefcello, in the duchy of Modena, in the year 1498. Of his education nothing is known, but when he was a young man he was invited to refide with the count Gianfranceico Gambara of Brefcia, a man illuftrious for his patronage of letters. To this nobleman Nizzoli acknowledges the higheft obligations for fupporting him by his liberality, and favouring him in his literary ftudies. His work, entitled “*Thefaurus Cicero-nianus*,” was undertaken at the inftance of his patron, and printed at his houfe in 1535. Nizzoli was appointed private tutor to the marquis di Soragna, and was afterwards profeffor of eloquence in the univerfity of Parma. Here he wrote his work “*De veris Principiis et vera ratione Philofophandi*,” firft published in 1553. In 1562, he was appointed, by prince Vefpafiano Gonzaga, director and profeffor of the new univerfity at Sabionetta. At its opening he delivered a Latin oration, which was printed in the following year. In an infcription to his memory at Brefcello, dated 1576, he is faid to have died at the age of feventy-eight. Nizzoli was one of the moft elegant Latin writers of his time. His *Thefaurus* has been feveral times reprinted, with additions, under the title of “*Apparatus Latinæ Locutionis*.” A new edition of the “*De veris Principiis Philofophandi*,” &c. was printed by Leibnitz, with an illuftrative preface.

NO, or No-AMMON, in *Ancient Geography*, a town of Egypt, mentioned by the ancient prophets Ezekiel and Nahum, and placed by Jerome near Alexandria.

NOACALLY, in *Geography*, a river of Bengal, which

runs into the bay of Bengal, N. lat. $22^{\circ} 45'$. E. long. $92^{\circ} 16'$.

NOACHI COLUMBA, in *Affronomy*. See COLUMBA.

NOAD, in *Geography*, a town of Hindooftan, in Madura; 18 miles W.N.W. of Coilpetta.

NOADA, a town of Bengal; 50 miles N.W. of Ramgur.

NOAGUR, a town of Bengal; 23 miles S.E. of Doefa.

NOAH, in *Biography*, a patriarch and prophet, was the fon of Lamech, a descendant of Seth, the third fon of Adam, was born in the year 2948 B.C. In his days a general corruption of manners prevailed among the human race, but he had the fortitude to preferve himfelf uncontaminated by the evil examples which furrounded him, and fecured to himfelf the divine approbation by his piety and other exemplary virtues. He undertook the office of a public preacher of righteoufnefs, and endeavoured, by his exhortations and admonitions, to reform the morals of his contemporaries, and to reftore true religion among them. His efforts were of no avail, and as the people funk deeper under the dominion of vice, they were sentenced to deftruction by an univerfal deluge, from the effects of which Noah and his family were faved, by being directed to build an ark or vefel, which fhould float on the waters, and thus preferve all thofe who were admitted into it. This tremendous ruin, recorded in the Old Testament, and evidently referred to in various fabulous authors, took place in the year 2349 B.C., when Noah was fix hundred years old. (See ARK and DELUGE.) After this, Noah lived till the year 1998 B.C. in the 950th year of his age. See the book of Genefis, chap. v.—ix. for various other particulars relating to Noah and his family: fee alfo Anc. Univer. Hift. and Blair’s Chronology.

NOAH’S ARK. See ARK.

NOAH’S ARK SHELL, in *Natural Hiftory*, the name of a kind of fea-shell, which authors were always puzzled about referring to any genus, till a late French author has referred it to a new genus he had made under the title *cordiformis*, taking in the bucardia, and triangular heart-shells. The cabinets of the curious afford us three fpecies of this fhell; the common kind, a yellow and white kind with broad irregular lines, and a variegated kind. We have another fhell of this genus, which no one ever doubted to belong to it, which yet is of an oblong figure, and fo much refembles the Noah’s ark, as to plainly fhew they ought both to be reckoned fpecies of the fame genus. This is the oblong bucardium, or ox-heart fhell, commonly called the *baftard* Noah’s ark.

NOAILLES, LOUIS ANTHONY DE, in *Biography*, was born in 1651, and being devoted in early live to the duties of the church, he obtained confiderable preferment. In 1676 he was nominated bifhop of Cahors, from whence he was removed to Chalons, and laftly to the fee of Paris in 1695. He laid down capital rules for the conduct of his clergy; but his peace was difturbed by the Jefuits in confequence of the approbation which he gave to Quesnel’s Reflexions on the New Testament. In 1700 he was raifed to the dignity of cardinal, and on this occafion Louis XIV. faid to him, “I have more pleafure in procuring for you the cardinal’s hat, than you have in receiving it.” Notwithftanding this, the king was afterwards prejudiced againft him by father Tellier, the Jefuit. Pope Clement XI. was alfo fet againft him, and iflued his famous bull of *Unigenitus*, on occafion of Quesnel’s book, which Noailles had fanned. The cardinal was exiled, but after the death of Louis, Tellier was banifhed in his turn, and the cardinal recalled. He died in 1729.

NOAILLES, **ADRIAN-MAURICE**, *Duc de*, a celebrated French general, nephew of the preceding, who flourished in the eighteenth century, early devoted himself to military pursuits. He served with his father in Catalonia, and afterwards under Vendôme, both in Spain and in Flanders. In 1703 he commanded in Roussillon, and gained several important advantages over the enemy. In 1710 he made himself master of Gironne, one of the most important places in Catalonia, for which Philip V. created him a grandee of Spain, and Louis XIV. made him field-marshal. In the succeeding reign he was appointed president of the council of finances, but when Dubois obtained the ascendancy at court, Noailles was exiled. On the death of that minister he was recalled and restored to his place. In 1733 he commanded at the siege of Philippsburg, and obliged the Germans to abandon Worms. He afterwards served with high reputation in Italy. He died in 1766.

NOAILLES, in *Geography*, a town of France, in the department of the Oise, and chief place of a canton, in the district of Beauvais; 7 miles S.E. of Beauvais. The place contains 632, and the canton 8298 inhabitants, on a territory of 185 kilometres, in 22 communes.

NOAKPOUR, a town of Hindoostan, in Bahar; 25 miles W.S.W. of Arrah.

NOALE, a town of Italy, in the Trevisan; 9 miles S.S.W. of Treviso.

NOANAGUR, a town of Bengal, in the province of Tippera; 20 miles N. of Comillah. N. lat. 23° 45'. E. long. 91° 20'.

NOANAGUR, or *Gutchnagar*, a town of Hindoostan, and capital of a district, in the country of Guzerat, near the gulf of Cutch; 178 miles W.S.W. of Amedabad. N. lat. 22° 22'. E. long. 62° 30'.

NOANAMAS, a town of South America, in the province of Choco, chiefly inhabited by Indians; 170 miles N. of Popayan. N. lat. 5° 15'. W. long. 76° 46'.—Also, a river of South America, which runs into the Pacific ocean, N. lat. 4° 45'.

NOANGONG, a town of Bengal; 30 miles S. of Rajemal.

NOARA, LA, a town of Sicily, in the valley of Demona; 10 miles S.E. of Patti.

NOB, **NOBE**, *Noba*, or *Nomba*, in *Ancient Geography*, a sacerdotal city of Palestine, at the farthest extremity westward of the tribe of Benjamin, and the place where the ark some time rested, after the taking of Shiloh by the Philistines, so totally ruined by king Saul, on account of the small assistance which the high priest Abimelech had given the fugitive David, that according to St. Jerome, it lay in ruins in his time, which were then visible at a small distance from Diospolis.

NOBA, in *Geography*, a small island in the East Indian sea, near the W. coast of Aroo. S. lat. 5° 5'. E. long. 135° 13'.

NOBBER, a small post-town of Ireland, in the county of Meath, noted as the birth-place of O'Carolan, the Irish bard. It is 33½ miles N.N.W. from Dublin.

NOBILIARY, a collection, or historical account, of the noble families of a province, or nation.

Chorier has published a nobiliary of Dauphiné; and Caumartin, another of Provence. The Germans are particularly careful of their nobiliaries, to keep up the purity of their families.

NOBILISSIMUS, in *Antiquity*, a title, or quality, given to the princes of the imperial family.

F. Doucine advances, that the title *nobilissimus* was first given under the emperor Justin; others find the title *nobilis*

Caesar, or *N. C.* that is *Nobilissimus Caesar*, on medals long before that time, even as early as Trajan. Spanheim and Joubert, indeed, set this title on medals no higher than the time of Philip the Younger; though it appears earlier in some inscriptions; so that even Mr. Tillemont is mistaken, where he says, the quality of *nobilissimus* is not to be found in history before the time of Constantine the Great, who first gave it to his two brothers; after which it was attributed to such of the emperor's children as were not *Cæsars*. See **CÆSAR**.

Tristram adds, that the *Cæsars* bore the title of *nobilissimi* in all ages; but that the *nobilissime* first became a distinct independent dignity in the time of Constantine the Great.

NOBILITY, a quality that dignifies, or renders a thing noble; particularly, that raises a person possessed thereof above the rank of a peasant or commoner.

In England, indeed, the term nobility is restrained to degrees of dignity above knighthood. Every where else nobility and gentility, or gentry, are the same. See **GEN-TLEMAN**.

Some refer the origin of nobility in Europe to the Goths: who, after they had seized a part of Europe, rewarded their captains with titles of honour, and called them *nobles*, *nobiles*, to distinguish them from the common people.

Nobility, in England, is only conferred by the king, and that by writ or by patent, in virtue whereof it becomes hereditary. In other countries there are other ways of acquiring it.

The nobility of England is called the *peerage of England*. Its degrees are only five; viz. that of a duke, a marquess, earl or count, viscount, and baron. See under **DUKE**, **MARQUIS**, &c.

The distinction of rank and honours is necessary in every well governed state, in order to reward such as are eminent for their services to the public, in a manner most agreeable to themselves, and without burthen to the community; and at the same time to excite in others a spirit of laudable emulation. In our mixed and compounded constitution, a body of nobility is peculiarly necessary, as a barrier to withstand the encroachments both of the crown and of the people. It creates and preserves, says judge Blackstone, that gradual scale of dignity which proceeds from the peasant to the prince; rising like a pyramid, from a broad foundation, and diminishing to a point as it rises. It is this ascending and contracting proportion that adds stability to any government; for when the departure is sudden from one extreme to another, we may pronounce that state to be precarious. The nobility, therefore, constitutes the pillars, which are reared from among the people, more immediately to support the throne; and if that falls, they must also be buried under its ruins. And as titles of nobility are thus expedient in the state, it is also expedient that their owners should form an independent and separate branch of the legislature. See **PARLIAMENT**.

The privileges of the English nobility are very considerable: they are all esteemed as the king's hereditary counsellors, and are privileged from all arrests, unless for treason, felony, breach of peace, condemnation in parliament, and contempt of the king. No supplicavit can be granted against them; no capias, or exigent, sued against them for action of debt, or trespass; and no effoign lies against them: in criminal cases they are only to be tried by a jury of peers, who are not put to their oath; but their verdict upon their honour suffices. They also answer to bills in chancery upon their honour, and not upon their oath; but when they are examined

mined as witnesses, either in civil or criminal cases, they must be sworn. In their absence from parliament, they are allowed a proxy to vote for them; and in all places of trust they are allowed to constitute deputies, by reason of the necessity the law supposes them under of attending the king's person. The honour of peers is so highly tendered by the law, that it is much more penal to spread false reports of them and certain other great officers of the realm, than of other men: scandal against them being called by the peculiar name of "scandalum magnatum," and subjected to peculiar punishments by divers ancient statutes. (3 Edw. I. c. 34. 2 Ric. II. st. 1. c. 5. 12 Ric. II. c. 11.) A peer cannot lose his nobility but by death or attainder. It has been said, indeed (Moor. 678.), that if a baron wastes his estate, so that he is not able to support the degree, the king may degrade him; but it is expressly held by later authorities (12 Rep. 107. 12 Mod. 56.) that a peer cannot be degraded but by act of parliament. See PEERS and PARLIAMENT.

Guillim observes, that if an appeal of murder, or felony, be sued by a commoner against a peer, he shall be tried by commoners, not peers. See APPEAL.

No peer may go out of the kingdom without the king's leave: if any have leave, he is to return upon the king's writ, or to forfeit goods and chattels.

Anton. Matthæus observes, that nobility, among the Romans, was a quite different thing from what it is among us. The nobles, among the Romans, were either those raised to the magistrature, or descended from magistrates: there was no such thing as nobility by patent.

Bartoli says, that doctors, after they have held a professor's chair in an university for twenty years, become noble, and are entitled to all the rights of counts.

But this claim is not admitted at court, &c. though Bartoli's sentiments be backed with those of several other authors, particularly Chassanæus, in his *Consuetudin. Burgundicæ*; Boyer sur la Coutume de Berry; Faber C. de Dig. Def. 9. &c. which last, however, restrains Bartoli's rule to doctors in law, and prince's physicians.

By an edict of the French king, in 1669, it is declared, that trade shall not derogate from nobility, provided the person do not sell by retail.

In Bretagne, by ancient custom, a nobleman loses nothing by trading even in retail: but he re-assumes all his rights as soon as he ceases to traffic, his nobility having slept all the time. In Germany, a woman, not noble by birth, doth not become, *v. gr.* a countess, or baroness, by marrying a count, or baron: a lady of the higher degree, indeed, becomes a princess by marrying a prince; but this does not hold of a lady of the lower nobility.

On the coast of Malabar, children are only capable of being noble by the mother's side: it being allowed them to take as many husbands as they please, and to quit them whenever they think good.

NOBLE, NOBILIS, a person who has a privilege which raises him above a commoner, or peasant, either by birth, by office, or by patent from his prince.

The word comes from the Latin *nobilis*; formed from the ancient *noſcibilis*, *distinguishable*, *remarkable*.

In England, the word noble is of a narrower import than in other countries; being confined to persons above the degree of knights; whereas, abroad, it comprehends not only knights, but what we simply call *gentlemen*.

The nobles of England are also called *pares regni*, as being *nobilitatis pares*, though *gradu impares*.

The Venetian noblesse is famous: it is in this that the

sovereignty of the state resides. It is divided into three classes. The first only comprehends twenty-four families.

The second includes the descendants of all those who were entered into the golden book, in 1289, and destined to govern the state, which then began to be aristocratic.

The third consists of such as have bought the dignity of noble Venetians.

This last class is only admitted to the inferior employments; the two former, to all indifferently.

The title of noble Venetians is sometimes also given to foreign kings, princes, &c.

NOBLE also denotes a money of account, containing six shillings and eight-pence.

The noble was anciently a real coin, under the denomination of *Rose-noble*.

Authors observe, that there has not been any piece of gold and silver of this name coined with us since 9 Hen. V. They were first coined by Edw. III. in 1334.

The noble contained 80d. the same with the present money of account. Its half was called *obolus*, containing 40d. its fourth part the *quadrans*, or farthing in those days, 20d.

NOBLE, EUSTACHE LE, in *Biography*, a copious and very miscellaneous writer, was born in 1643, of a distinguished family at Troyes. He was educated for the profession of the law, and rose by his talents to the post of procureur-general in the parliament of Metz. He obtained a high reputation, but was charged with having forged certain acts of court to his own emolument. Being committed to the Chatelet, he was condemned to an amende-honorable, and banished for nine years; from this sentence he appealed, and was transferred to the Conciergerie. After this, for some misconduct with respect to Gabrielle Perreau, known by the name of La Belle Epiciere, he was again sentenced to be banished for several years. He, however, obtained permission to remain in France, on the condition of ceasing to execute any judiciary office. His misfortunes produced no amendment in his life and morals, but he continued as dissipated as ever till his death in 1711, at the age of sixty-eight. He was reduced to such a state of indigence, that he was buried at the charge of the parish, though his works are said to have produced above 100,000 crowns to the publishers. These have been collected in nineteen volumes 12mo. They have been divided into three classes. 1. The serious, consisting of historical and political pieces, and some indeed, notwithstanding the looseness of his character, on the subject of religion; of these, his "Entretiens Politiques sur les Affaires du Temps," a periodical publication, was highly popular on account of its pleasantry and low wit. 2. The romantic, comprising a number of works, half history and half romance. 3. The poetical, consisting of translations, fables, tales, comedies, epistles.

NOBLEBOROUGH, in *Geography*, a township of America, in Lincoln county, Maine, incorporated in 1788, and containing 804 inhabitants; 10 miles S.E. of Newcastle. — Also, a town in the Herkemer county, New York, on the head-waters of Canada creek.

NOBODY KNOWS WHAT, a name given by Capt. Cook to the northern arm of Dusky bay.

NOBREGA, MANOEL DA, in *Biography*, the head of the first Jesuits that ever set foot in South America, a country in which that body of people have exerted themselves more than in any other part of the world. He was a native of Portugal, studied first at Coimbra, and afterwards at Salamanca, then returning to Coimbra, he graduated in canon law. His father and uncle held high official stations

stations at court, which seemed to promise him almost any degree of preferment, but failing to obtain some university rank on which his heart was set, and which ought to have been awarded him, he rejected the world, as he thought the world had rejected him, and entered, in this fit of disgust, the newly established order of Jesuits in 1544.

When it was determined that Jesuit missionaries should be sent to Brasil, Nobrega was nominated head of the mission, and he, with five others, set sail with Thomé de Sousa, the first governor-general of Brasil, in February 1549. They immediately began that system of kindness and conciliation towards the natives of South America, from which the Jesuits never deviated, and on which they established their empire in Paraguay. Nobrega was as able a statesman as he was a missionary, and to him it was owing, that the French did not succeed in establishing themselves in Rio Janeiro, and dividing Brasil with the Portuguese, or, perhaps, ejecting them from it. He was nominated vice-provincial of Brazil in 1550, and provincial in 1553, when that country was made a separate province. He died in 1570, at the age of fifty-three, but worn out with the fatigues of a missionary life. Gen. Biog.

NOBSQUASSIT, or NOBSCUSSET, in *Geography*, the N.E. part of Yarmouth, in Barnstable county, Massachusetts, in which are 25 salt-works, that annually produce 500 bushels of marine salt.

NOBUTPOUR, a town of Hindoostan, in Benares; 21 miles E. of Benares.

NOCARIO, a town of the island of Corsica; 12 miles N.E. of Corte.

NOCE', a town of France, in the department of the Orne, and chief place of a canton, in the district of Mortagne; five miles E. of Belesme. The place contains 1161, and the canton 10,667 inhabitants, on a territory of 182½ kilometres, in 18 communes.

NOCEA, a town of European Turkey, in the Morea; 20 miles E. of Mistra.

NOCERA, a town of Italy, in the duchy of Spoleto, the see of a bishop; 16 miles N.E. of Spoleto. N. lat. 43° 7'. E. long. 12° 48'.

NOCERA delli Pagani, a town of Naples, in Calabria Citra, the see of a bishop, suffragan of Salerno; containing 12 parish churches, and six convents. This town, anciently called "Nuceria Alphatorna," and being a Roman colony, had the privilege of coining money. It appears a cluster of villages, and is said to contain 30,000 inhabitants; 20 miles S.E. of Naples. N. lat. 40° 44'. E. long. 14° 27'.

NOCERIANA TERRA, *Earth of Nocera*, in the *Materia Medica*, a white earth, being a species of bole, used in medicine in Germany, Italy, and some other parts of the world, but not known in the English shops. It is found at Nocera, in Umbria, whence its name. It is now dug principally about Macerata, a city in the marquisate of Ancona, in the pope's territories, and is in great esteem in malignant fevers, and against the bites of venomous animals.

It is a dense earth, of a greyish-white, very hard, and of an insipid taste, and does not effervesce with acid menstruums.

NOCKAMIXON, in *Geography*, a township of America, in Buck's county, Pennsylvania, containing 846 inhabitants.

NOCKLE, in *Rural Economy*, a provincial term often applied to a mallet or beetle. It is sometimes written *knockle*.

NOCOR, in *Geography*, a river of Morocco, which runs into the Mediterranean, N. lat. 35° 15'.

NOCTAMBULATIO, in *Medicine*. See SOMNAMBULISM.

NOCTANTER, in *Law*, is the name of a writ issuing out of the Chancery, and returnable in the King's Bench; given by the statute of West. 2. 13 Ed. I. cap. 46. by virtue of which statute, where any one having right to approve waste ground, &c. makes and erects a ditch or a hedge, and it is thrown down in the night-time, and it cannot be known by a verdict of assize or jury, by whom; if the neighbouring vills will not indict such as are guilty, they shall be distrained to make again the hedge or ditch at their own costs, and to answer damages. The word *noctanter* is so necessary in an indictment of burglary, that it hath been adjudged insufficient without it.

NOCTIBO, in *Ornithology*, the name given by the Portuguese to a small Brazilian bird, a species of the *goat-sucker*, or *churn-owl*, more known among naturalists by its Brazilian name *ibijau*.

NOCTILIO, in *Zoology*. See VESPERTILIO *Leporinus*.

NOCTILUCA, among *Naturalists*, a species of phosphorus, so called because it shines in the night, without any light being thrown on it: such is the phosphorus made of urine; by which it stands distinguished from some other species of phosphorus, which, before they shine, must be exposed to the sun-beams; such is the Bononian-stone, &c.

Mr. Boyle, in a particular treatise on the subject, gives an account of three noctilucae. The first, invented by Krafft, he calls the *confissent*, or *gummeous* noctiluca, as being of a texture not unlike that of a cherry-gum. This, on account of its uninterrupted action, was, by the Germans, called the *constant* noctiluca; among us it is now known under the denomination of the *solid phosphorus*. The second is liquid, invented by the said Krafft; this is only a dissolution of the former in a convenient liquor. The third kind was prepared by Mr. Boyle himself; and was of a different nature from both the others; for it would not shine of itself like either of them, but required the contact of the air (though not any external rays or heat) to make it produce light, which would be very durable, in a well stopped vessel. Add, that it was not the body that shone, but an exhalation, or effluvium, mixed with the air; on which accounts the inventor gives it the denomination of the *aerial* noctiluca.

The same Mr. Boyle, afterwards, prepared another sort; which from the little pellucid fragments or crystals therein, he denominated the *icy* noctiluca. See PHOSPHORUS.

NOCTUA, in *Ornithology*, a species of owl. See STRIX *Noctua*. For other species of *Noctua*, see STRIX.

NOCTUA *Aurita*, a name by which some have called the smaller species of the horn-owl, more usually distinguished by the name *otus*.

NOCTUA *Canora*, a name given by Nieremberg to a bird of the Spanish West Indies, called by the natives *chicuati*, and sometimes kept by the Spaniards in cages. See CHICUATLI.

NOCTUA *Minor*, a name given by Mr. Ray to the *keutzlin*, or, as others call it, the *schaffelt*, a very beautiful bird of the owl kind, and not exceeding the size of the common thrush. See STRIX *Passerina*.

NOCTUINI OCULI, a name given by some to grey eyes, from their resembling those of the *noctua*, or *owl*.

NOCTUOLENT, among *Botanists*, a name given to such plants as smell strongest in the night-time. See DOG-ROSE.

NOCTURNAL, something that relates to night, *nox*;

in contradistinction to diurnal. In this sense we say, nocturnal assemblies; nocturnal walks; nocturnal pollutions, &c.

NOCTURNAL Pains are a frequent concomitant of venereal disorders, which can only be palliated with narcotics; nothing but a mercurial course, or a long-continued use of diet-drinks, can entirely remove them.

NOCTURNAL Arch, in *Astronomy*, the arch of a circle described by the sun, or a star, in the night.

Semi-NOCTURNAL Arch of the Sun is that portion of a circle he passes over between the lower part of our meridian, and the point of the horizon in which he rises; or between the point of the horizon in which he sets, and the lower part of our meridian.

NOCTURNAL, or Nocturlabium, is more particularly used for an instrument, chiefly used at sea, to take the altitude or depression of some of the stars about the pole, in order to find the latitude, and the hour of the night.

There are nocturnals of various contrivances, some of them projections of the sphere; such as the hemispheres, or planispheres, on the plane of the equinoctial: those ordinarily used by the seamen are two; the one adapted to the polar star, and the first of the guards of the Little Bear; the other to the pole-star, and the pointers of the Great Bear.

NOCTURNAL, Construction of the. The instrument consists of two circular plates (*Plate I. Navigation, fig. 10.*) applied on each other. The greater, which has a handle to hold the instrument, is about $2\frac{1}{2}$ inches diameter, and is divided into twelve parts, agreeing to the twelve months; and each month subdivided into every fifth day; and so, as that the middle of the handle corresponds to that day of the year, wherein the star here regarded has the same right ascension with the sun.

If the instrument be fitted for two stars, the handle is made moveable. The upper left circle is divided into twenty-four equal parts, for the twenty-four hours of the day, and each hour subdivided into quarters, as in the figure. These twenty-four hours are noted by twenty-four teeth; to be told in the night. Those at the hours twelve are distinguished by their length. In the centre of the two circular plates, is adjusted a long index, A, moveable upon the upper plate. And the three pieces, viz. the two circles and index, are joined by a rivet which is pierced through the centre, with a hole two inches in diameter for the star to be observed through.

NOCTURNAL, Use of the. Turn the upper plate till the longest tooth, marked 12, be against the day of the month on the under plate; then, bringing the instrument near the eye, suspend it by the handle, with the plane nearly parallel to the equinoctial; and viewing the pole-star through the hole of the centre, turn the index about, till, by the edge coming from the centre, you see the bright star or guard of the Little Bear (if the instrument be fitted to that star); then that tooth of the upper circle, under the edge of the index, is at the hour of the night, on the edge of the hour-circle; which may be known without a light, by accounting the teeth from the longest, which is for the hour 12.

NOCTURNAL Crimes, Prevention of. See **HOMICIDE**.

NOCTURNAL Pollution. See **POLLUTION**.

NOCUM, in *Geography*, a town of Hindoostan, in the circar of Sirhind; 20 miles N. E. of Tannasar.

NOCUMENTI ASSISA. See **ASSISA**.

NODAN, in *Geography*, a town of Prussia, in the province of Samland, on the coast of the Baltic; 14 miles N. of Pillau.

NODAR, or **NOUDAR**, a town of Portugal, in Alentejo; 21 miles S. E. of Mourao.

NODATED HYPERBOLA, a kind of hyperbola, which, in turning round, decussates or crosses itself.

NODDLE'S ISLAND, in *Geography*, a small, pleasant, and fertile island in Boston harbour, Massachusetts, about two miles E. N. E. of the town; occupied as a farm, and yielding large quantities of hay.

NODDY, in *Ornithology*. See *STERNA Fuliginosa*.

NODE denotes, in *Surgery*, a swelling of the periosteum, tendons, or bones, from a venereal cause. The progress of the disease in this form is extremely slow, and attended with little pain. In some cases, however, the pain is considerable, particularly in the night time. Nodes continue a long time before matter is formed, and when suppuration does take place, it is of a very imperfect kind.

Sudden swellings of the periosteum, without nocturnal pains, are not venereal.

The bones which are peculiarly liable to nodes, are such as are superficial; for instance, the front surface of the tibia, the bones of the cranium, the triangular part of the ulna below the olecranon, &c.

The treatment of nodes is considered in the article **LUES Venerea**.

NODERMALM, in *Geography*, an island of Sweden, on which stands a part of the city of Stockholm. On it are a palace and opera-house, an ancient arsenal now converted into a theatre, three churches, an observatory, &c.

NODES, in *Astronomy*, the two points wherein the orbit of a planet intersects the ecliptic.

Such are the two points C and D (*Plate XVII. Astron. fig. 7.*) of which the node C, where the planet ascends northwards above the plane of the ecliptic, is called the *ascending node*, the *northward node*, and the *head of the dragon*; and is thus marked, ☊.

The other node D, where the planet descends to the south, is called the *descending node*, the *southward node*, or the *dragon's tail*; thus marked, ☋. See **DRAGON'S head and tail**.

The right line DC, wherein the two circles intersect, is called *the line of the nodes*.

It appears from observation, that the line of the nodes of all the planets constantly changes its place, and shifts its situation in *antecedentia*; i. e. from east to west, contrary to the order of the signs.

Thus, by a retrograde motion, the line of the moon's nodes, moving at the rate of about $19\frac{1}{2}^{\circ}$ in a year, finishes its circuit in eighteen years two hundred and twenty-five days; in which time, after having receded from any point of the ecliptic, it returns to the same. See **MOON**.

Sir Isaac Newton has not only shewn, that this motion arises from the action of the sun, but has calculated, with great skill, all the elements and varieties in this motion, from its cause.

In order to understand the action of the sun in this case, we must conceive the plane of the moon's motion to pass always through the centre of the earth and the centre of the moon, and to be a plane in which the right line joining their centres, and the right line that is the direction of the moon's motion, or the tangent of her orbit, are always found. It is certain, that if the earth and moon were always acted on equally by the sun, they would descend equally towards the sun; the plane determined always by these two lines, would descend with them, keeping always parallel to itself, so that the moon would appear to us to revolve in the same plane constantly, with respect to the earth. But the inequalities in the action of the sun (see **MOON**) will bring the moon out of this plane to that side of the plane on which the sun is, in the half of her orbit that is nearest the sun, and towards the other

other side, in the half of her orbit that is farthest from the sun. Whence we shall have this general rule for judging of the effect of the sun on the nodes: that while the moon is in the half of her orbit that is nearest the sun, the node towards which she is moving is made to move towards the conjunction with the sun; and while the moon is in the half of her orbit which is farthest from the sun, the node towards which she is moving is made to move towards the opposition; but when the nodes are in conjunction with the sun, its action has no effect upon them. In the first case, the moon is brought into a direction which is on the same side as the sun is, of that direction which she would follow of herself; and the intersection of a plane passing through this direction and through the centre of the earth, will cut the ecliptic, on that side towards which the moon moves, in a point nearer the conjunction than if there was no action of the sun to disturb her motion. In the other case, the action of the sun has a contrary direction, and for the same reason makes the ensuing node move towards the opposition. When the line of the nodes produced passes through the sun, then the sun, being in the plane of the moon's motion, has no effect to bring her to either side; and therefore, in that case, the nodes have no motion at all. By applying this reasoning, it appears, that in every revolution of the moon, the retrograde motion of the nodes exceeds the direct motion, excepting only when the line of the nodes passes through the sun, when there is no motion of the nodes at all. Sir Isaac Newton finds from the theory of gravity, that the nodes ought to move backward about $19^{\circ} 18' 1''$ in the space of a year, and the astronomical tables make this motion $19^{\circ} 21' 21''$, whose difference is not $\frac{1}{360}$ of the whole motion of the nodes in a year. By a more correct computation of this motion from its cause, the theory and observation agree within a few seconds. (See MOON.) The inclination of the moon's orbit to the ecliptic is also subject to many variations. When the nodes are in the quarters, while the moon moves from one quarter to the conjunction, the action of the sun diminishes the inclination of the plane of her orbit; the inclination of this plane is least of all when the moon is in the conjunction; it increases again as she moves from the conjunction to the next quarter, and is there restored nearly to its first quantity. When the line of the nodes passes through the sun, the inclination of the moon's orbit is not affected by the action of the sun; because, in that case, the plane of her orbit produced, passes through the sun, and, therefore, the action of the sun can have no effect to bring the moon out of this plane to either side. In this last case the inclination of the moon's orbit is greatest; it increases as the nodes move towards the quarters; and it is least of all when the nodes are in the quarters, and the moon either in the conjunction or opposition. Newton has calculated these irregularities from their causes, and finds his conclusions agree very well with the observations of astronomers. When the moon is in the node, she is also in the ecliptic, viz. twice in each period; when she is at her greatest distance from the nodes, viz. in the points E, F, she is said to be in her greatest north or south latitude, according as she is then on the north or south side of the ecliptic.

The moon must be in or near one of the nodes when there is an eclipse, either of the sun or moon.

The place of the moon's nodes may be determined, either in the same way as that of the nodes of the other planetary orbits, or by the following method. In a central eclipse of the moon, the moon's place at the middle of the eclipse is directly opposite to the sun, and the moon must also then be in the node; calculate therefore the true place of the sun, or, which is more exact, find its place by observation, and the

opposite point will be the true place of the moon, and consequently the place of its node. (See MOON.) Before the nodes of the planetary orbits can be found, it will be necessary to shew how to reduce the places of the planets seen from the earth to the places seen from the sun, and how to compute the heliocentric latitudes. Let E (*Plate XVIII. Astronomy, fig. 1.*) be the place of the earth, P the planet, S the sun, γ the first point of Aries; draw P ν perpendicular to the ecliptic, and produce ES to a . Compute, at the time of observation, the longitude of the sun seen at a , and you have the longitude of the earth at E, or the angle γ S E; compute also the longitude of the planet, or the angle γ S ν ; and the difference of these two angles is the angle E S ν of "commutation." Observe the place of the planet in the ecliptic; and the place of the sun being known, we have the angle ν E S of elongation in respect to longitude; hence we know the angle S ν E, which measures the difference of the places of the planets seen from the earth and the sun; therefore the place of the planet seen from the earth being known, the place seen from the sun will be known. Also, tang. P E ν : rad. :: ν P : E ν by trig. and rad. : tan. P S ν :: ν S : ν P :: tang. P E ν : tan. P S ν :: ν S : E ν :: sin. S E ν : sin. E S ν ; that is, the sine of elongation in longitude : sine of the difference of the longitudes of the earth and planet :: tang. of the geocentric latitude : tan. of the heliocentric latitude. When the latitude is small, S ν : E ν is very nearly as P S : P E, which, in opposition, is very nearly as P S : P S - S E. The "curtate" distance S ν of the planet from the sun may be found by this proportion, rad. : cos. P S ν :: P S : S ν . See HELIOCENTRIC LATITUDE.

Now to determine the place of the node, find the planet's heliocentric latitudes just before and after it has passed the node, and let a and b be the places in the orbit, m and n the places reduced to the ecliptic; then the triangles amN , bnN (*fig. 2.*), which we may consider as rectilinear, being similar, we have $am : bn :: Nm : Nn$; therefore, $am + bn : am :: Nm + Nn (mn) : Nm$, or $am + bn : mn :: am : Nm$; that is, the sum of the two latitudes : the difference of the longitudes :: either latitude : the distance of the node from the longitude corresponding to that latitude. Or, if we take the two latitudes from the earth, it will be very nearly as accurate when the observations are made in opposition. If the distance of the observations should exceed a degree, this rule will not be sufficiently accurate. In this case our computations must be made for spherical triangles in the following manner. Put $mn = a$, $am = \beta$, $bn = b$,

$$Nm = x; \text{ then by trigon. } \frac{\sin. a - x}{\tan. b} = \cotan. N = \frac{\sin. x}{\tan. \beta}, \text{ radius being unity : but } \sin. a - x = \sin. a \times \cos. x - \sin x \times \cos. a; \text{ hence } \frac{\sin. a \times \cos. x - \sin. x \times \cos. a}{\tan. b} = \frac{\sin. x}{\tan. \beta}; \text{ therefore, } \frac{\sin. a \times \tan. \beta}{\tan. b + \cos. a \times \tan. \beta} = \frac{\sin. x}{\cos. x} = \tan. x.$$

The longitudes of the nodes of the planets for the beginning of 1750 are, Mercury, $1^{\circ} 15' 20'' 43''$; Venus, $2^{\circ} 14' 26' 18''$; Mars, $1^{\circ} 17' 38' 38''$; Jupiter, $3^{\circ} 7' 55' 32''$; Saturn, $3^{\circ} 21' 32' 22''$; Georgian, $2^{\circ} 12' 47''$.

To determine the inclination of the orbit, we have am the latitude of the planet, and mV its distance upon the ecliptic from the node; hence, $\sin. mN : \tan. am :: \text{rad.} : \tan. \text{ of the angle } N$. But the observations which are near the node must

must not be used to determine the inclination, as a very small error in the latitude will make a considerable error in the angle. The inclination may also be found thus: find the angle $P S v$ (*fig. 1.*), then the place of the planet and that of its node being given, we know $v N$; hence, $\sin. v N$: $\tan. P v$: rad. : $\tan. P N v$, the inclination of the orbit. See Vince's *Elem. of Astronomy*.

NODHA, in *Geography*, a town of Persia, in the province of Mecran; 63 miles S.W. of Kidge.

NODHEA, a town of Persia, in the province of Ker-man; 75 miles N.N.E. of Sirgian.

NODINGEN, an island of Sweden, near the W. coast, in the N. sea. N. lat. $57^{\circ} 16'$. E. long. $11^{\circ} 50'$.—Also, a town of Sweden, in West Gothland; 12 miles N. of Gothenburg.

NODULE, NODULUS, in *Pharmacy*, a bag of medicinal ingredients put into beer, or wine, to give its tincture thereto. Nodules are sometimes also parcels of odoriferous simples, tied up in a piece of silk, for the patient to be frequently smelling to.

NODUS, KNOT. See KNOT.

NODUS, in *Poetry*, &c. See INTRIGUE and PLOT.

NODUS, or *Node*, in *Dialling*, denotes a point or hole in the gnomon of a dial, by the shadow or light whereof, either the hour of the day in dials without furniture, or the parallels of the sun's declination, and his place in the ecliptic, &c. in dials with furniture, are shewn.

NODUS is also used for a hole in the ceiling of a room, or in the window, for the making of a dial on the floor, wall, or the like.

NOË, in *Geography*, a town of France, in the department of the Upper Garonne, on the river Garonne; 17 miles S. of Toulouse.

NOEL, two islands in the Indian sea, near the coast of Siam. N. lat. $10^{\circ} 33'$ to $10^{\circ} 47'$. E. long. $96^{\circ} 30'$ to $96^{\circ} 48'$.

NOELS, a kind of air, similar to our Christmas carols, sung by the common people at the Nativity. The airs of Noels, says M. Rousseau, ought to have a rustic and pastoral character, agreeable to the simplicity of the words, and that of the shepherds supposed to have sung them in going to render homage to the infant Jesus in the manger.

NOERZA, in *Zoology*. See MUSTELA *Lutreola*.

NOESA BASON, in *Geography*, an island in the East Indian sea, near the S. coast of Java, about 25 miles in circumference. S. lat. $6^{\circ} 36'$. E. long. 113° .

NOESA Cambaz, or *Pulo Cannibaz*, an island in the East Indian sea, near the S. coast of Java, about 45 miles in circumference. S. lat. $7^{\circ} 42'$. E. long. $109^{\circ} 22'$.

NOESA Comba, a small island in the East Indian sea. S. lat. $5^{\circ} 20'$. E. long. 117° .

NOESA Laver, a small island in the East Indian sea, near the S. coast of Ceram. S. lat. $3^{\circ} 34'$. E. long. $129^{\circ} 10'$.

NOESA Nessing, a small island in the East Indian sea, near the N. coast of Timor. S. lat. $8^{\circ} 9'$. E. long. $126^{\circ} 30'$.

NOESA Seres, two small islands in the East Indian sea. S. lat. $5^{\circ} 15'$. E. long. $116^{\circ} 58'$.

NOETIANS, in *Ecclesiastical History*, disciples of Noetus, an Ephesian, the master of Sabellius.

They only allowed of one person in the godhead; *viz.* the Father; and accordingly taught, that it was God the Father that suffered on the cross. An error, says Epiphanius, who wrote a hundred years after Noetus, never heard of before; though it is certain there had been other patripassians in the church before him.

Being reprehended by his superiors, Noetus made them

this answer: "What harm have I done? I adore only one God; I own none but him. He was born, suffered, and is dead."

NŒUDS. The fixed points in every vibrating string which divide it into aliquot parts, and which produce a different sound from the whole string, are called nœuds, or knots; for example, of two strings, one of which is triple the length of the other, if the shortest is caused to sound, the longest will likewise sound, not as the whole string, but in unison with the shortest; because the longest string then, instead of sounding in its totality, divides itself, and only produces the sound of one of its third parts. The immovable points, which are the divisions, act as so many bridges, and these are what M. Sauveur calls *nodes*, naming them at the same time the swellings or undulations of the several aliquot parts where the vibrating string deviates most from a right line.

If, instead of making another and a shorter string sound, we divide the longest by some small impediment which will check its vibration without totally stopping it, the same case will still happen in making one of the aliquots sound; for then both will sound in unison with the shortest, and we shall see the same *nœuds* and the same *bellies* as before.

If the shortest part is not an exact aliquot of the longest, but a common aliquot, then there will be no resonance, or only that of the smallest part, unless it is struck with such violence as to force the obstacle, and make the whole string sound.

M. Sauveur contrived to exhibit these nœuds and bellies to the Academy, in a way very clear, by putting bits of coloured paper on the string, for then at the sound of the aliquot they always saw the papers at the bellies fall, and those of the nœuds remain undisturbed. See a representation of these effects *Plate Music*. Pere Merfenne was the first who discovered, and demonstrated these natural divisions of a sounding string by experiments. Harm. Univ.

NOEWE, in *Geography*, a town of America, in the state of Tennessee; 21 miles S. of Knoxville.

NOFESCH, in *Natural History*, a word of Hebrew origin, used as the name of a precious stone. There has been much dispute among the commentators on the Old Testament, what stone it was. It seems derived from the root *fuch*, which signifies the ruby or carbuncle, and as a derivative of that word, it must be supposed to express a red stone, not one of any other colour. As the ruby is signified by *fuch*, this cannot mean the same stone, and therefore probably meant the garnet, they having no other name, that we know of, for that stone, and it being very like the ruby.

NOGALES, in *Geography*, a town of Spain, in Estramadura; 20 miles S.S.E. of Badajoz.

NOGARA, a town of Italy, in the department of the Benaco; 13 miles W. of Legnano.—Also, a town of the county of Tyrol; nine miles N.E. of Trent.

NOGARCOT, a town of Asia, in the country of Nepal, in which is a celebrated pagoda; 50 miles N.E. of Cath'mandu. N. lat. $28^{\circ} 11'$. E. long. $86^{\circ} 8'$.

NOGARO, a town of France, in the department of the Gers, and chief place of a canton, in the district of Condom; 21 miles S.W. of Condom. The place contains 1559, and the canton 11,700 inhabitants, on a territory of 3274 kilometres, in 42 communes. N. lat. $43^{\circ} 45'$. E. long. $0^{\circ} 2'$.

NOGAROLA, LEWIS, in *Biography*, an Italian man of letters, was descended from an illustrious family, born at Verona towards the commencement of the 16th century. He applied with great success to the study of the Greek language, and acquired a high reputation by the various Latin

versions of books written in that tongue. In 1545 he was appointed one of three commissioners to whom was committed the care of supplying Verona with provisions in a time of scarcity. Soon after this he was sent to the council of Trent, where he gained much applause, by a discourse pronounced before that assembly. In 1554 he was made a knight of the republic of Verona, and in the following year he was appointed president of the jurisdiction over the work-people in the silk-manufactories. He died at Verona in the year 1559. His works were numerous, of which we notice the following. A Latin translation of a work attributed to St. John Damascenus, on the subject "De iis qui fidem dormierunt." In the year 1549 he published at Venice "Apostolicæ Institutiones in parvum Libellum collectæ:" to this he annexed his discourse delivered before the council of Trent. In 1552 he printed, in quarto, a Latin treatise relating to the periodical increase of the Nile, from a very rare work, printed at Milan under the title of "Timotheus, five de Nilo, &c." He translated also "De Universa Natura" of Ocellus Lucanus, which was printed at Venice in 1559; and reprinted at Heidelberg in 1598, and at Cambridge in 1671. Nogarola also published a Latin "Letter to Adam Fumano, canon of Verona, on the persons of illustrious Italian families who have written in Greek," which is given in the Venice edition of Ocellus' work; in the "Opuscula Mythologica," published at Cambridge in 1671, and in the "Supplementa et Observationes ad Vossium de Historicis Græcis et Latinis," by John Albert Fabricius, published at Ham-
burgh in 1709. Moreri.

NOGARUOLA, in *Geography*, a town of Italy, in the Veronese; 19 miles S.S.E. of Verona.

NOGAT, an island at the mouth of the Vistula, bounded N. by the old Vistula, E. by the Frisch Haff, S.E. by the Nogat river, and W. by the Vistula; about 30 miles in length from N. to S., and from five to fifteen broad; well watered and fertile.

NOGATA, a town of Japan, in the island of Ximo; 15 miles N. of Taifero.

NOGAYANS, called also *Mankats*, one of the main branches of the Tartars; which, according to the Arabic and Grecian writers, owes its origin to a Mongole chieftain, named Nogay, who, towards the close of the 13th century, was sent with a strong body of troops by a khan of Kaptshak to conquer the countries lying beyond the Euxine, and who actually subjected the regions from the Don to the Danube, but afterwards shook off the sovereignty of the khans of Kaptshak, and became the founder of an empire, which was soon destroyed under his successors. After the annihilation of this state, the name of its founder continued in the nation which he had governed; and it is very probable that the Nogayans spread themselves from the Volga to the Ural, and thence again as far as the Irtysh, and were not driven out of these regions by the Kalmuks till the era of the Russian sovereignty. They now inhabit the Steppes on the N. side of the Caucasian mountains and the Euxine quite to the other side of the Danube, and consist of several larger and smaller stems, which at times are known to change their place of abode, and even their names. The Nogayans subject to Russia, are partly in what was formerly called the Eastern Nogay or the Crimean Steppe, partly in the Kuban, and partly dispersed about the Volga, and in other regions of the empire. The "Eastern Nogay" forms the northern larger half of the province of Taurida, denominated by the Russians the "Crimean Steppe." It is about twice as large as the peninsula of the Krim, and was formerly much larger; but in 1739, by the peace of Belgrade, more than half of

it came under the Russian sceptre, which part belongs at present to the government of Ekaterinofslaf. The remainder, which had likewise formed a part of the states of the Crimean khans, fell to Russia, on her taking possession of the Krim (Crim) in 1783; and this now constitutes the circles Melitopol and Dneprovsk in the province of Taurida. The eastern Nogay has shared the fortune of the Krim, and has been inhabited by the same people. The Nogayan Tartars now form a considerable part of its population.

The second and at present the only main seat of the Nogayans is the Kuban (Cuban). The Kubanian Nogays, called also the little or black Nogays, are distributed into various hordes or stems, of which the Kafay-aut and the Naarus-aut are the most remarkable, composing together about 10,000 families. It is said that the population of all the eastern and Kubanian Nogays amounted, a few years ago, to upwards of 500,000 families; but this is probably an exaggerated account. Besides these, who are lately come under the Russian sovereignty (Kuban being taken possession of by the Russians in 1783), there are, in various parts of the empire, other remains and colonies of this nation of Nogays. Tooke's Russia, vol. i.

NOGELN, a town of Prussia, in the province of Samland; 52 miles N. of Königsberg.

NOGENT *Haut Marne*, a town of France, in the department of the Upper Marne, and chief place of a canton, in the district of Chaumont; nine miles S.E. of Chaumont. The place contains 1949, and the canton 8638 inhabitants, on a territory of 240 kilometres, in 20 communes.

NOGENT-le-Rotrou, a town of France, and principal place of a district, in the department of the Eure and Loire, on the Eure; 12 miles N. of Chartres. The place contains 6780, and the canton 11,552 inhabitants, on a territory of 152½ kilometres, in 12 communes. N. lat. 48° 20'. E. long. 0° 55'.

NOGENT-Roulebois, a town of France, in the department of the Eure and Loire, and chief place of a canton, in the district of Dreux. The place contains 2290, and the canton 10,733 inhabitants, on a territory of 215 kilometres, in 22 communes.

NOGENT-sur-Seine, a town of France, in the department of the Aube, and principal place of a district; nine miles E.S.E. of Provins. The place contains 3208, and the canton 10,152 inhabitants, on a territory of 170 kilometres, in 17 communes. N. lat. 48° 30'. E. long. 3° 35'.

NOGG, in *Rural Economy*, a provincial word often used to signify strong beer.

NOGHE, in *Geography*, a town of Nubia, on the right bank of the Nile; 50 miles N.E. of Sennaar.

NOGONG, a town of Bengal, capital of the circar of Barbackpour; 50 miles N.E. of Moorshedabad. N. lat. 24° 48'. E. long. 88° 53'.

NOHOTH, a river of Thibet, which runs into the Sanpoo; 21 miles W.S.W. of Tankia.

NOHUKUN, a river of Mexico, which rises in the province of Yucatan, and runs into the bay of Honduras by several mouths. N. lat. 17° 30'. W. long. 90° 16'.

NOHUTTA, a town of Bengal; 18 miles W. of Natore. N. lat. 24° 28'. E. long. 88° 46'.—Also, a town of Bengal; five miles S.W. of Mahmudpour.—Also, a town of Hindoostan, in Bahar; 33 miles E.S.E. of Durbungah. N. lat. 25° 59'. E. long. 86° 40'.

NOIA, a town of Naples, in the province of Otranto; five miles S.E. of Nardo.—Also, a town of Naples, in Basilicata;

licata; 12 miles S.S.W. of Turfi.—Alfo, a town of Naples, in Bari; 25 miles E.S.E. of Bari.

NOIERA, a town of Naples, in Principato Citra; seven miles W.N.W. of Salerno.

NOILSBERG, a town of Bohemia, in the circle of Leitmeritz; 18 miles N.W. of Leitmeritz.

NOIR, JOHN LE, in *Biography*, who flourished in the 17th century, was the fon of a counsellor of Avignon, and intended for the church. Having excellent natural abilities, which he improved by a liberal education, he was ordained priest, and acquired a high reputation at Paris and other cities, as an eloquent and popular preacher. As a reward of his merit, he was promoted to the canonry and prebend in the cathedral church of Seez. Jealous of his fame, the Jesuits attempted to injure his credit, and even directed against him the fury of a number of fanatics who appeared in Normandy. Le Noir was a zealous defender of the principles of Janfenism; the fanatics, just referred to, assembled where he was preaching a course of sermons, and having erected an image of the Virgin at the crossing of the streets, chanted litanies before it every evening, into which were introduced the words "Virgo extirpatrix Janfenitarum." Under the feet of this image was the figure of a black serpent, by which they meant to designate the prebendary of Seez. They used other means likewise to destroy the influence of Le Noir. At length the civil power thought it right to interfere, and after committing the ring-leaders to prison, dispersed the rest. After this he had a contest with his bishop, who obtained against him a *lettre de cachet*, in the year 1663, by which M. le Noir, under the pretence of having propagated erroneous notions, was, for a time, exiled to Fougères in Brittany. On his return he attacked the prelate when about to take possession of the archbishopric of Rouen, upon the translation of Harlay, archbishop of that see, to the see of Paris. The process against his diocesan was referred, by the king's council, to the ecclesiastical judges, before whom it lay many years. In 1682 he opposed the election of Harlay, archbishop of Paris, to the office of president in the assembly of the clergy, under the plea that he had not yet cleared himself from the suspicion of heresy, and was, of course, ineligible by the canons. In the following year M. le Noir was arrested and committed prisoner to the Bastille, where a process was carried on against him, before special commissaries, who pronounced him guilty of publishing defamatory writings, and adjudged him to make the *amende honorable* before the metropolitan church of Paris, and then to be sent to the galleys for life. The first part of the sentence was executed upon him, but the punishment of the galleys was exchanged for imprisonment. He was confined first at St. Malo's; afterwards in the citadel of Breft; and lastly at Nantes, where he died in 1692. He was author of several works; of which may be noticed "A Collection of Requests, or Cases, &c." in folio, relative to the treatment of the Janfenists, which work is said to display a passionate eloquence, with a profound and very uncommon knowledge of law, and will be found useful by the ecclesiastical historian: "The indisputable advantages of the church over the Calvinists, in the controversy between M. Arnauld and the minister Claude:" "The new political Light, or the new Gospel of cardinal Palavicini, revealed by himself in the history of the council of Trent," which occasioned the suppression of a French translation of that history which was about to be published. Moreri.

NOIR, Cape, in *Geography*, a cape on the S.W. coast of the island of Terra del Fuego, at the entrance of the straits of Magellan. S. lat. 54° 30'. W. long. 73° 33'.—Alfo, a cape on the northern side of Chaleur bay, about

seven leagues W.N.W. of Bonaventure.—Alfo, a cape on the S. coast of the island of Milo. N. lat. 36° 47'. E. long. 24° 22'.

NOIR, Fr., *black*, a note of music, *note noir*, a crotchet, or half a minim; *noirs à queue*, a quaver. In the old Fr.

music there were several kinds of black notes, black with a tail, black square, black lozenge. The two last have remained in plain chant; but in secular music nothing but the crotchet and its divisions remain black. The note with a black head, straight, and a tail, which we call a crotchet, the French call a *noir*, and the quaver with a hook to the tail, which the French, with more propriety, call a *croche*, or hook.

NOIRA, in *Ornithology*. See *Psittacus Garrulus*.

NOIR-AURORA, in *Ornithology*. See *Muscicapa Rutililla*.

NOIR-ETABLE, in *Geography*, a town of France, in the department of the Loire, and chief place of a canton, in the district of Montbrison; 18 miles S.S.W. of Roanne. The place contains 1887, and the canton 6990 inhabitants, on a territory of 202½ kilometres, in 10 communes.

NOIRMOUNT POINT, a cape at the entrance of St. Aubin's bay, on the S. coast of the island of Jersey.

NOIRMOUTIER, an island of France, in the department of the Vendée, and chief place of a canton, in the district of Les Sables-d'Olonne, separated from the continent of France by a strait three leagues long, and from about a quarter to one league wide. The canton contains 5420 inhabitants, on a territory of 67½ kilometres, in one commune. N. lat. 46° 58'. W. long. 2° 9'.

NOIR-SOUCI, in *Ornithology*. See *Loxia Bonariensis*.

NOIX, ISLEAU, or NUT Island, in *Geography*, a small island near the N. extremity of lake Champlain.

NOKA, a town of Hindooistan, in Bahar; 14 miles N.N.E. of Saferam.

NOKISSIMA, or *Burning Island*, a small Japanese island. N. lat. 34° 15'. E. long. 139° 20'.

NOKRE-KOH, a mountain of Grand Bucharra, so called from its silver mines; 100 miles E. of Balk.

NOKSELA, a town of Bengal; 45 miles N.E. of Nattore.

NOLA, a town of Naples, in the province of Lavora, which, as some say, owed its origin to the Greeks of Chalcis; but, according to others, it was founded by the Etruscans, forty years before the building of Rome. The Romans took it during the Samnite war. It afterwards became a Roman colony, and Vespasian gave it the name of Augustus. Near this town Hannibal was twice defeated by the Roman arms under Marcellus. This town, which was anciently rich and flourishing, is still a handsome town, the see of a bishop, suffragan of Naples. The silk spun in the neighbourhood is much esteemed; 13 miles E. of Naples. N. lat. 40° 53'. E. long. 14° 20'.

NOLACHUCKY, a river of America, in the E. part of the state of Tennessee, which runs W.S.W. into French Broad river, about 26 miles from Holston river.

NOLANA, in *Botany*, a Linnæan genus, named from the bell-shaped form of its corolla, and derived from *Nola*, a little bell. Linn. Gen. 79. Schreb. 104. Willd. Sp. Pl. v. 1. 794. Mart. Mill. Dict. v. 3. Ait. Hort. Kew. ed. 2. v. 1. 304. Juss. 132. Lamarck Illustr. t. 97. Gærtn. t. 132.—Class and order, *Pentandria Monogynia*. Nat. Ord. *Asperifolia* or *Lurida*, Linn. *Borraginæ*, Juss.

Gen. Ch. Cal. Perianth inferior, of one leaf, turbinate at the base, five-sided, divided into five, heart-shaped, acute,

permanent segments. *Cor.* of one petal, bell-shaped, plaited, spreading, somewhat five-lobed, twice as large as the calyx. *Stam.* Filaments five, awl-shaped, erect, equal, shorter than the corolla; anthers arrow-shaped. *Pist.* Germens five, superior, roundish; style between the germens, cylindrical, straight, the length of the stamens; stigma capitate. *Peric.* Drupas five, depressed, ovate. *Seed.* Nut the shape of the drupa, with three or four cells. Kernels solitary, roundish, finely dotted.

Eff. Ch. Corolla bell-shaped. Style between the germens. Drupas five. Nut three or four-celled.

1. *N. prostrata.* Trailing Nolana. Linn. Sp. Pl. 202. Linn. fil. Dec. 1. 3. t. 2. Sims in Bot. Mag. t. 731. (*Teganium procumbens*; Schmid. Ic. 67. t. 18.)—Native of Peru. It was cultivated in 1761, by Mr. Philip Miller, and flowers from July to September. *Root* annual, simple, thread-shaped, often three feet long, black. *Stems* a foot long, herbaceous, prostrate, branched, roundish, very smooth, with white and purplish dots. *Leaves* in alternate pairs, stalked, ovate, rhomboidal, entire, somewhat fleshy, smooth, flat, veined, unequal in size. *Flowers* solitary, on long, hairy stalks, of a pale blue colour, beautifully streaked from the centre with veins of dark purple, and shaped much like those of *Convolvulus tricolor*.

There appears to be some ambiguity respecting the natural order to which *Nolana* should be referred. Linnæus was not satisfied with having placed it among his *Asperifoliæ*. Jussieu hints that it has the habit both of *Convolvuli* and *Solanæ*, whilst Gærtner is of opinion that it should be referred to the latter order.

NOLANA, in *Gardening*, comprehends a plant of the herbaceous trailing annual kind, of which the species cultivated is the trailing nolana, (*N. prostrata*.)

Method of Culture.—The plants in this species may be raised by sowing the seeds on a hot-bed in March. When they are fit to remove, they should be planted out singly into small pots filled with light earth, plunging them into a fresh hot-bed to bring them forward. When their flowers open in the summer, as July, they should have a large share of air admitted when the weather is warm, to prevent their falling away without producing seeds. Under this management the plants often continue flowering till the early frosts destroy them, and ripe seeds are produced in the beginning of the autumnal season.

They afford variety among other tender annuals.

NOLAY, in *Geography*, a town of France, in the department of the Cote-d'Or, and chief place of a canton, in the district of Beaune; 10 miles S.W. of it. The place contains 2039, and the canton 10,871 inhabitants, on a territory of 175 kilometres, in 19 communes.

NOLDIUS, CHRISTIAN, in *Biography*, a learned Danish divine, was born at Hoybia, in Scania, in the year 1626. He obtained the early part of his education at Lunden; whence he was removed, in 1644, to the university of Copenhagen. Here he distinguished himself by the great progress which he made in his studies, and was enrolled among the citizens of the metropolis. In 1650 he was nominated rector of the college at Landskron; and in the following year took his degree of M.A. In 1654 he set out on his travels into foreign countries, visited all the celebrated universities of Germany, and obtained introductions to many of the most eminent divines and other literary characters in that country, and afterwards to those of Holland, England, and France. After this he returned to his native country for a short time, and then set out for Holland a second time, and pursued his studies nearly three years in the universities of Franeker and Leyden. In 1660 he undertook

the office of tutor and governor of the sons of the lord of Gerstorff, grand master of the palace to the king of Denmark, and in a few years was ordained minister and elected professor of divinity in the university of Copenhagen. To this post the king was pleased to add the honourable one of rector of that seminary. Noldius died in 1683, at the age of fifty-seven. He is known as an author, by "*Concordantiæ particularum Hebræo Chaldaicum*," &c. of which the best edition is that of Jena in 1734, 4to: "*Sacrarum Historiarum et Antiquitatum Synopsis*:" "*Historia Idumæa, seu, de Vita et Gestis Herodum Diatribe*:" "*Logica*," and an edition of Josephus's History. Moreri.

NOLI, in *Geography*, a sea-port town of the Ligurian republic, the harbour of which is defended by a fort, inhabited chiefly by fishermen, the see of a bishop; 25 miles S.W. of Genoa. N. lat. 44° 11'. E. long. 8° 28'.

NOLI ME TANGERE, in *Botany*, &c. See *IMPA-TIENS*.

NOLI ME TANGERE, in *Surgery*. This curious name is applied to a species of herpes, which is frequently seen making its attack on the skin of the nose. The disease consists of small superficial ulcerations, which usually commence on the ala of the part, and are more or less concealed beneath furfuraceous scabs. The complaint is connected with specific morbid action in the part affected, and the matter secreted seems to have the power of infecting the adjoining skin to which it is applied. Hence the noli me tangere often proves exceedingly obdurate, spreading on one side, healing on another, and then breaking out again in places, where, at one time, the complaint seemed to have entirely ceased.

The writer of this article has repeatedly seen nearly the whole nose gradually destroyed by this frequently intractable malady. He has several times seen the morbid process suspended for six months, or even a year, and then renew its ravages with increased vehemence.

Such authors as have attempted to explain the causes of this species of herpes, have only displayed their own credulity, without throwing the least light upon the subject.

The ulcerations of noli me tangere do not generally extend to the parts far within the nostrils; but, some time ago, there was, under Mr. Harvey, in St. Bartholomew's hospital, a curious example, in which the greatest part of the nose was destroyed, and the ulceration proceeded even through the front part of the palate into the mouth. The morbid process sometimes stops for a considerable time, and then is renewed with increased violence. The following case illustrates the nature of noli me tangere, and one mode of treatment to which it yielded: Jane Chatillon, forty-five years of age, was attacked, in the course of September, 1788, with an inflammation on the left ala of the nose. Some time afterwards the part ulcerated, which occasioned a troublesome and sometimes a painful itching; different means were unsuccessfully employed, and the case remained nearly in the same situation till the month of September in the following year. At this period the ulcer spread very fast; the septum nasi, the muscles, and cartilages of both sides, were, in a short space of time, destroyed. The ulceration extended on the left side, on the loose edge of the upper-lip. This was the state of her case on her admission into the hospital of St. Louis, in the month of October, 1789.

A poultice, moistened with aq. veg. was applied twice a day to the ulcer; a sudorific psitan prescribed, and a pill, composed of one grain of cal-mel, and one grain of sulph. aurat. antimonii, ordered to be taken every day. From the fifth day, the inflammation lessened. No other sensible alteration

alteration took place till the 21st. The suppuration, that, till this time, had been black and putrid, now became white and inodorous.

On the 37th, the discharge was trifling, and the ulcer, being well deterged, was dressed with pledgets, dipped in a solution of verdigris and corrosive sublimate, in the proportion of six grains of each to a pint of water. On the 40th day, cicatrization began to take place, and was finished by the 60th.

Some time before it was completely cicatrized, an issue was made in the arm, which was healed up, without any inconvenience to the patient, six months after the cure. *Parisian Chirurgical Journal*, vol. i.

One of the best external applications to *noli me tangere* is the following lotion: *R. Kali arsenicati gr. iv. Aqu. menthæ fativæ ʒiv. Spiritus vini tenuioris ʒj. Misce et cola.* We have seen several cases in St. Bartholomew's hospital, very lately, which were either cured or seemed disposed to get well with this application. The solution of arsenic, which Mr. Home has always used, is made by boiling white arsenic in water for several hours, in a sand-heat. When given internally, the dose is from three to ten drops; when for external application, a dram is to be diluted with ʒij of water; and this solution is gradually made stronger, as the parts become accustomed to it, till it is of double strength. However, this mode of using arsenic is by no means a well regulated one; and Plunket's caustic, (see ARSENIC,) for outward employment, is not nearly so neat an application as the above-mentioned lotion. At St. Bartholomew's hospital, arsenic is administered internally in the following formula: *R. Kali arsenicati gr. ij. Aquæ menthæ fativæ ʒiv. Spiritus vin. ten. ʒj. Misce et cola.* Dosis ʒij ter quotidie. In this way, the quantity of arsenic is nicely determined. We shall only just add, with regard to this medicine, that, both as an external application and an inward remedy, in cases of *noli me tangere*, it perhaps deserves the highest rank. One scruple of the *argentum nitratum*, dissolved in half an ounce of distilled water, makes a very good application, which, although generally inferior, in point of efficacy, to arsenical ones, in the present disease occasionally does good, when nothing else seems to produce any benefit. The case above makes us acquainted with another lotion, which deserves further trial. All fluid remedies must be applied to the part, by dipping little bits of lint in them, placing these on the ulcerations, and covering the whole with a pledget.

The ointments, which seem most likely to prove useful applications to *noli me tangere*, are the *unguentum hydrargyri nitrati*, the *unguentum picis*, and *unguentum sulphuris*. As far as our experience extends, they are generally less efficacious than lotions in the present cases; but, in particular instances, they prove superiorly useful, and, it deserves particular notice, that surgeons can often make no progress against this inveterate disease, unless they apply a different sort of dressing every day; sometimes a lotion; at other times an ointment. The little ulcers may occasionally be touched with the *argentum nitratum*. The small furfuraceous scabs, which are continually forming on the part affected, should be softened with a little of the *unguentum spermatis ceti*, and removed with as much tenderness as possible.

We have already remarked, that arsenic is a good internal medicine, and the best mode of exhibiting it is already explained. Another medicine, which is often useful in these cases, is what is known by the name of Plummer's pill, or the compound calomel pill. *R. Calomelanos, sulphuris antimonii præcipitati, singulorum gr. xii. Guaiaci gummi*

refinæ gr. xxiv. Saponis quod fatis sit. Misce fiant pilulæ duodecim. Dosis una bis quotidie. In other instances, we may try the decoctum ulmi, or farfaparilla, with one of the following pills thrice a day. *R. Calomelanos gr. vj. Extracti conii ʒj. Misce fiant pilulæ duodecim.* The hydrargyrus sulphuratus has also been recommended as an alternative remedy in cases of *noli me tangere*. Cooper's First Lines of the Practice of Surgery, edit. 3. and Dictionary of Surgery, edit. 2. Deault's Parisian Chirurgical Journal, vol. i. &c.

NOLIN CREEK, in *Geography*, a branch of Green river, in Kentucky.

NOLINA, in *Botany*, so named by Michaux, in compliment to "P. C. Nolin, a Frenchman, an ardent cultivator of American plants more especially, to the great benefit of botany as well as agriculture." Mich. Boreal-Amer. v. 1. 207.—Class and order, *Hexandria Trigynia*. Nat. Ord. *Coronariæ*, Linn. *Junci*, Juss.?

Gen. Ch. *Cal.* none. *Corolla* of one petal, in six deep, spreading, nearly equal, oval segments. *Stam.* Filaments fix, awl-shaped, shorter than the corolla; anthers oblong, somewhat heart-shaped, slightly notched at the top. *Pist.* Germen superior, triangular; style very short; stigmas three, obtuse, recurved. *Peric.* Capsule roundish, with three angles, membranous, of three cells, the partitions from the inflexed margins of the valves. *Seeds* solitary, obovate, smaller than the cell and attached to its base, seldom more than one perfected in each capsule.

1. *N. georgiana*.—Native of Georgia in North America. *Bulb* tunicated, perennial. *Leaves* several, radical, spreading in every direction, from five to nine inches long, a line broad, grassy, thick and rigid, rough at the edges. *Stalk* clothed below with a few scattered awl-shaped leaves, two feet high or more, distantly and loosely branched above; its branches racemose; flower-stalks aggregate. *Flowers* minute, whitish.

Such is nearly the account of Michaux, who considers this genus as allied to *Helonias* on one hand, and to *Phalangium* of Jussieu (*Anthericum* of Linnæus) on the other. He places it in the order *Trigynia*, but describes the style as simple, though the stigmas are three. We have presumed to term *corolla*, after Linnæus, what he calls *calyx petaloideus*.

NOLINSK, in *Geography*, a town of Russia, in the government of Viatka; 40 miles S. of Viatka. N. lat. 57° 44'. E. long. 50° 14'.

NOLLE, a town of France, in the department of the Po; 8 miles N. of Turin.

NOLLE *Prosequi*, is used in *Law*, where a plaintiff in any action will proceed no farther, and may be before or after a verdict, though it is usually before; and it is then stronger against the plaintiff than a nonsuit, which is only a default in appearance; but this is a voluntary acknowledgment that he hath no cause of action.

NOLLET, JOHN ANTHONY, in *Biography*, who flourished in France in the last century, was born at Pimpré, in the diocese of Noyon, in the year 1700. He was educated at the college of Clermont in the Beauvoisin, and afterwards went to Beauvais, where he laid such a foundation in classical learning that his parents were encouraged to send him to Paris, to go through a course of philosophy at the university. Their wish was, that he should embrace the ecclesiastical profession, and he readily acceded to it. From a very early age he had shewn a taste for the pursuits of natural science, in which he afterwards so highly distinguished himself: for the present, however, he checked his ruling passion; as being likely to interfere with the studies more appropriate to his destined

destined character, and gave himself up entirely to the study of scholastic theology. In 1728 he was admitted to deacon's orders, and soon became a licensed preacher. He had not followed this profession very long before he felt an inclination for the sciences, which was, in a short time, irresistible, and he now devoted his fine talents almost wholly to the study of natural philosophy. He became known and attached to M. du Fay and Reaumur, and with their assistance he made a rapid progress in those branches of knowledge for which these philosophers were distinguished. By the former he was received as an associate in his electrical researches, and the latter resigned to him his laboratory. In 1734 he accompanied his friends du Fay, du Hamel, and de Jussieu on a visit to England, where he was admitted a foreign member of the Royal Society. Two years afterwards he made a tour into Holland, where he formed an intimate connection with s'Gravefande and Musschenbroek. Upon his return to Paris he resumed a course of experimental philosophy, which he commenced in 1735, and which he continued during the long space of 25 years. The courses delivered by Nollet gave rise to the adoption of similar plans in other branches of science, such as chemistry, anatomy, natural history, &c. In 1738 a public professorship of experimental philosophy was established at Paris under the patronage of cardinal Fleury, and the abbé Nollet was the first person who received that appointment. During the following year, the Royal Academy of Sciences appointed him adjunct mechanician to that body, and in 1742 he was admitted an associate. In 1739, the king of Sardinia being desirous of establishing a professorship of physics at Turin, invited the abbé Nollet to perform a course of experimental philosophy before the royal family, with which he complied. From Turin he made a tour in Italy, where he made many observations, and collected some excellent facts respecting the natural history of the country. In the year 1744 he was called to Versailles to give lectures to the dauphin in natural philosophy, at which the king and royal family were frequently present. In the year 1749, the abbé Nollet took a second journey into Italy, whence many wonderful accounts had been circulated throughout Europe, of the communication of the medicinal virtues by electricity, which seemed, at that time, to be supported by numerous well attested facts. To examine into these electrical miracles, as they were then thought, and to be assured of their truth or fallacy, was a grand motive with our author in passing the Alps at this time, and in visiting the philosophers who had published accounts of those experiments. But though he engaged them to repeat their experiments in his presence, and upon himself, he was soon convinced that the pretended facts were deceptions or great exaggerations, and that no method had been discovered, by means of which the power of medicine could by electricity be made to insinuate itself into the human body. The abbé did not confine his enquiries to these facts only, but extended them also to all the branches of natural philosophy, the arts and agriculture. After his return to France, the king, in 1753, established a professorship of experimental philosophy at the college of Navarre, and nominated the abbé Nollet to fill that post. In the year 1757 the king bestowed upon him the *brevet* of master of natural philosophy and natural history to the younger branches of the royal family of France, and in the same year appointed him professor of natural philosophy to the schools of artillery and engineers. Soon after this last instance of preferment he was received a pensionary of the Royal Academy of Sciences. This celebrated naturalist and experimental philosopher died in 1770, deeply regretted by that part of the public, of all countries, who were ca-

pable of appreciating his worth, as well as by the numerous friends whose attachment he had secured by the amiableness of his manners and the goodness of his heart. Independently of a vast number of papers published by the abbé in the different volumes of the "Memoires" of the Academy of Sciences, from the year 1740 to 1767, he was author of "Recherches sur les Causes particulières des Phénomènes électriques," 1749, 12mo; "Lettres sur l'Electricité," 3 tom. 12mo, 1749, 1760, 1767; "Leçons de Physique," 6 tom. 12mo, 1764; "Essai sur l'Electricité des Corps;" "L'Andes experiences," 3 tom. See Priestley's Hist. of Electricity, 4to. p. 100 and other parts; also Cavallo's Complete Treatise on Electricity, in three vols. Likewise the articles ELECTRICITY, and others relating to the same subject in vol. xii. of the New Cyclopædia. Also CIRCUIT, LEYDEN *Phial*, &c.

NOLLIN, DENNIS, a French biblical critic, who flourished in the early part of the last century, was educated to the bar, and acquired reputation in the character of an advocate of the parliament of Paris. Being, however, attached to theological studies, he directed his whole attention to the holy scriptures, and quitted his legal profession. He was a most diligent collector of whatever might tend to elucidate the writings of the prophets, apostles, &c. and his library is said to have contained a greater number of editions of the bible, of translations, and of commentaries on the scriptures, than had ever before belonged to any individual. This library, at his death, which happened in 1710, he directed to be sold for the benefit of the poor of his parish. He published "A Letter from N. Indes, divine of Salamanca, proposing a Method for correcting the Greek Septuagint Version, with an illustration of some difficult passages," which excited a controversy between the author and father de Tournemine. He was author also of "A Letter to M. l'Abbé B. relative to the new edition of the Septuagint by John Ernest Grabe," inserted in the "Supplement du Journal de Sçavans" for December 1710: "Two Dissertations, one on the French Bibles to the year 1541, and the other illustrative of a literary Phenomenon:" and "A Critical Letter on an anonymous Dissertation, and the Letters of M. Richard Simon, respecting the Antiquities of the Chaldeans and Egyptians," 1710. Moreri.

NOLSOE, in *Geography*, one of the smaller Faroer islands; six miles S. of OSTEROE. N. lat. 65° 10'. W. long. 6° 38'.

NOM DE JESUS, a town of the island of Zebu, one of the Philippine islands, the see of a bishop, suffragan of Manilla.

NOMA, NOME, (from *νεμω*, to eat away,) in *Surgery*, a phagedenic ulcer, or a species of herpes.

NOMADES, *Νομάδες*, from *νεμω*, *I feed*, a name given, in *Antiquity*, to several nations, or people, whose whole occupation was to feed and tend their flocks; and who had no fixed place of abode, but were constantly shifting according to the conveniences of pasturage.

The most celebrated among the Nomades were those of Africa, who inhabited between Africa, properly so called, to the east, and Mauritania to the west. They are also called *Numide*, or *Numidians*. Sallust says, they were a colony of Persians, brought into Africa with Hercules. The Nomades of Asia inhabited the coasts of the Caspian sea.

The Nomades of Arabia, according to Pliny (l. vi. c. 28.), occupied a territory east of the deserts of Palmyra, and extended from the southern coast as far as the Asphaltite lake; next to them were the Attali, who were accustomed to make incursions on the country of the Chaldeans, in the vicinity of the Euphrates. The Arabian Nomades, and the Attali, were

were bounded southward by the Scenites, who, according to Eustathius (in Dionys. p. 121.) inhabited the district between Cœlefyria and the Euphrates. Strabo (l. xvi.) places these people in the same situation with Pliny.

The Nomades of Scythia were the inhabitants of Little Tartary; who still retain the ancient manner of living. The Scythian Nomades, according to Pliny (l. iv. c. 12.), inhabited the country on the left side of the Caspian sea; and they were separated from the Georgii by the river Panticapes. Strabo says, that they lived in waggons instead of houses.

NOMAES, or NOMAO, in *Geography*, a town of Portugal, in the province of Beira; six miles S.E. of St. Joao de Pefqueira.

NO MAN'S LAND, a small island near the American coast, S.W. of Martha's Vineyard, about three miles long, and two broad; belonging to Duke's county, Massachusetts. N. lat. $41^{\circ} 15'$. W. long. $71^{\circ} 5'$.

NO MAN'S Land, in *Sea Language*, is a space between the after-part and belfrey, and the fore-part of a ship's-boat, when the said boat is stowed upon the booms, as in a deep waisted vessel. These booms are laid from the fore-castle nearly to the quarter-deck, where their after-ends are usually sustained by a frame called the gallows, which consists of two strong posts, about six feet high, with a cross-piece, reaching from one to the other, athwart ships, and serving to support the ends of those booms, masts, and yards, which lie in reserve to supply the place of others carried away, &c. The space called no man's land is used to contain any blocks, ropes, &c. which may be necessary on the fore-castle. It probably derives this name from its situation, as being neither on the starboard nor larboard side of the ship, nor on the waist or fore-castle; but being situated in the middle, partakes equally of all those places. Falconer.

NOMANCY, compounded of *nomen*, name, and *μαντια*, divination, a name given to the art of divining the fates of persons by means of the letters that form their names. Nomany, or, as it should rather be called, *nominomancy*, or *enomatomancy*, seems to be nothing else but the cabbalistic gematria.

NOMARCHA, in *Antiquity*, the governor or commander of a nome, or nomos.

Egypt was anciently divided into several regions, or quarters, called *nomes*, from the Greek *νομος*, taken in the sense of a division; and the officer who had the administration of each nome, or nomos, from the king, was called *nomarcha*, from *νομος*, and *αρχη*, command.

NOMBRE DE DIOS, in *Geography*, a port town of South America, in the province of Darien, at the bottom of a bay of the same name; destroyed soon after it was founded by the Indians of Darien, afterwards rebuilt, and occupied by its inhabitants until the year 1584, when Philip II. ordered them to be removed to Porto Bello, as a place better adapted to the commerce of the country; 30 miles E. of Porto Bello. N. lat. $9^{\circ} 36'$. W. long. $79^{\circ} 35'$.—Also, a large and populous town of Mexico, on the W. coast, near the Pacific ocean, in the province of Zacatecas. It became populous in consequence of the accession of inhabitants, on account of its silver mines; 85 miles N.W. of Zacatecas. N. lat. $24^{\circ} 6'$. W. long. $104^{\circ} 32'$.—Also, a river of Peru, called "Tambopalla," which runs into the Pacific ocean, S. lat. $17^{\circ} 10'$.

NOMBRE de Jesus, a town of South America, in the province of Quito; 35 miles N.W. of St. Josef de Huates.

NOMBRE de Maria, a town of South America, in the province of Quito; eight miles N.E. of St. Josef de Huates.

NOMBRE de Hios, a town of Mexico, in the province of New Biscay; 120 miles N. of Parral.

NOMBRIL POINT, in *Heraldry*, is the next below the fess-point; or the very centre of the escutcheon.

Supposing the escutcheon divided into two equal parts below the fess; the first of these divisions is the nombril; and the lower the base.

NOME, or NAME, in *Algebra*, denotes any quantity with a sign prefixed, or added to it, whereby it is connected with some other quantity; upon which the whole becomes a binomial, trinomial, or the like.

Thus $a + b$ is a binomial, whose names, or nomes, are a and b ; and $a + b + c$ a trinomial, whose names are a , b , and c , &c.

NOME, among the ancient Egyptians, a division, or province, into which the whole kingdom is divided. The origin of the nomes, according to Diodorus Siculus, was this: the inhabitants being refractory, and much inclined to insurrections, in order to prevent these, the kings divided the whole country into different provinces, or nomes, and established the worship of some particular animal in each of them, prohibiting, at the same time, such animal to be eaten within the bounds where it was worshipped. Hence, as every province was intoxicated with its own particular form, and object of worship, it entertained the highest contempt for that of its neighbours, and took a pleasure in profaning the animal, which among them had divine honours paid it. This religious opposition had the desired effect; for all mutual confidence being thereby cut off, there were no more insurrections against the government. Mem. Acad. Inscip. vol. xiii. p. 52.

NOME, in the *Ancient Greek Music*. Every melody determined by inviolable rules, was called by the Greeks a *nome*, or a law. The nomes acquired their denomination, 1st, from certain people, as the Æolian nome, the Lydian nome; 2dly, by the kind of rhythm or measure, as the Orthian nome, the Dactylic nome, the Trochaic nome; 3dly, by the name of their inventors, as the Hieracian nome, the Polymnestan nome; 4thly, from the subject, as Pythian nome, Comic nome; 5thly, and lastly, from their mode; as the Hypotoide or grave nome, Netoide or acute, &c. There were likewise nomes of half one mode and half another: there were others that were tripartite, of which Saccadas, or Clonas, was the author; the Dorian, Phrygian, and Lydian. (See SONG, and MODE.) The nomes and dithyrambs were equally hymns sung in honour of the gods. The nomes were for Apollo, as the dithyrambs were for Bacchus. Now the literal meaning of *νομος*, *nome*, being a *law* or *rule*, it should seem as if, after the invention of musical characters, the nomes were the first melodies, or tunes, that were written down, and rendered permanent and unalterable; whereas, before that period, music must have been played extempore, or by memory: and as Terpander, the inventor of a musical notation, is likewise said to have set the *νομοι*, or *laws* of Lycurgus, to music, the conjecture has both a literal and a figurative foundation. Aristotle, (Prob. xvii. 28.) asks why such different things as *laws* and *songs* had the same appellations? and answers the question himself, by saying, that before the knowledge of letters, *laws* were *sung*, in order to their being the better retained in memory. If, according to Josephus, the word *νομος* is not to be found in all the writings of Homer, it must, consequently, be a more modern term. The word, however, does occur in Homer's Hymn to Apollo, v. 20, though not in the Iliad or Odyssey.

NOMEN. See PRÆNOMEN, NAME, and AGNOMEN.

NOMENCLATOR, or NOMENCLULATOR, among the Romans,

Romans, was usually a slave, who attended persons that stood candidates for offices, and prompted or suggested to them the names of all the citizens they met, that they might court them, and call them by their names: which among that people was the highest piece of civility.

NOMENCLATOR of the *Romish Church*, was an officer, whose business it was to call the persons whom the pope invited to dinner.

He also listened to those who were admitted to audience, in the same manner as those now retained by the cardinals, called *auditors*.

NOMENCLATOIRES, among the *Botanical Authors*, are those who have employed their labours about settling and adjusting the right names, synonyms, and etymologies of names, in regard to the whole vegetable world.

NOMENCLATURE, NOMENCLATURA, a catalogue of several of the more usual words in any language, with their significations; compiled in order to facilitate the use and retaining of such words to those who are to learn the tongue.

We have Latin, Greek, French, &c. nomenclatures.

NOMENCLATURE, in *Botany*, which in its origin must have been entirely casual, and which, long after the science had made great progress, received no particular cultivation, was first reduced to fixed principles by Linnæus. He had this subject so much at heart, that he not only devoted to it 115 aphorisms, out of the 365 which compose his *Fundamenta Botanica*; and commented upon them, in common with the rest, in his *Philosophia*; but he published a much more ample elucidation of them, in an octavo volume, entitled *Critica Botanica*. This work, being very rare in England, has not here received the attention it deserves. Its object was, in the first place, to promote uniformity and simplicity in the nomenclature already established; and in the next to provide judicious regulations, for the contrivance and application of names for new discoveries. The author justly celebrates the useful labours of Caspar Bauhin, whose *Pinax* is a complete, if not a perfectly correct, system of nomenclature and synonyms, up to the time in which it was written. He goes on to lament those dissensions which took place under the Triumvirate, as he happily calls it, of Ray, Tournefort and Rivinus, when each of those great men, the leader of a sect and author of a system, adopted or contrived names at pleasure, without the smallest mutual consent or consideration. Victory indeed remained with Tournefort, in consequence of his successful labours in establishing the genera of plants, and no laurels were ever more justly won. His merits in this department, gave some popularity even to his system, with all its faults and inconveniences. His exertions made a stand, for a time, against the confusion, which an inundation of new discoveries must otherwise have produced. Science had time to rally her forces under his banners, till they could be marshalled with more precision, so as to be augmented from time to time, without endangering the safety of the republic, by producing anarchy instead of strength.

Generic names being tolerably well fixed by Tournefort, Linnæus had little to do in that department, except to introduce a few improvements and corrections, which he thought requisite. The great principle was established, that each genus should be characterised by the parts of fructification, and distinguished by an appropriate and fixed name. The old names, whose origin or meaning was lost in the darkness of antiquity, were applied with as much precision as they could. Nobody disputed about what should be called *Quercus* or *Rosa*, nor were the fastidious doubts of critics permitted to embroil *Vaccinium* and *Ligustrum*, nor to hinder

the progress of what they could not always advance. The ancient practice of dedicating certain plants to the honour of promoters of the science, was confirmed and imitated. New appellations were necessarily contrived for new genera, in which regard was had, as much as possible, to their characters, uses, or resemblances; and Tournefort seldom omitted to explain the names he invented, or those he adopted. Linnæus, in following his steps, introduced some reformatations, chiefly as to the rejection of compound or comparative names, or of new names of barbarous origin. It is to be regretted, that he and his pupils in general, have usually omitted to explain the meaning of the names they gave, in which there are often very fanciful and obscure allusions, not without frequent inaccuracies of construction; so that we are sometimes lost in conjecture, in attempting to unravel the mystery. The reader of the present work will find many instances of this in our botanical articles. He will also perceive, that though Linnæus might lay down excellent rules, he not unfrequently broke through them, sometimes perhaps from negligence, sometimes for the sake of peace. This great man was not unfrequently thwarted, in the department of nomenclature more especially, by persons who thought they acquired a sort of consequence by differing from him, and who found it easier to do so by inventing new names, than by improving upon his characters or descriptions, or by adding any thing to his information.

The specific names of plants were not so speedily established as the generic ones. Tournefort must yield the palm in this respect to Rivinus. The latter first attempted that brevity and uniformity in the nomenclature of species, which Linnæus afterwards adopted. Tournefort, as well as Ray, spoke of the species of plants, either in the phrases of old botanists, or in similar ones of their own contrivance, into which the utmost laxity of ideas was admitted. Hearsay appellations, random comparisons, or the native country of the plants, as frequently enter into such phrases, as their discriminative marks; nor are the latter, when they occur, chosen with an invariable regard to what is found or permanent. The length of these phrases renders them in general impossible to be remembered, and the want of uniformity in their plan greatly impedes their utility. Aware of all these defects, Linnæus contrived, what he at first called specific names, but which are in fact specific characters. His intention was, that these should supplant the above phrases; with which view he made them as concise as possible, limiting them to twelve words, at the furthest, and most frequently comprising each of them within a much smaller compass. These definitions however were found impracticable, for the use of even the most learned and assiduous botanists, as names; though their perfection is the very *acme*, and, as experience proves, the most difficult part of botany, as far as regards the knowledge of plants. Something was still wanting to enable botanists to converse with facility, as well as to register their own acquisitions. Haller contrived to number all the species of his *Helvetic Flora* in a regular series, and it is wonderful with what precision his pupils often recollect the appropriate number of each of his plants. This method however precludes the introduction of any new discoveries, and is liable to abundance of objections besides. It is com-mo-dious to number the species of each particular genus by itself, but no person would ever think of using such numbers as names.

At length Linnæus happily adopted the plan of Rivinus, of calling every plant by a single specific as well as a generic name. Thus he combined the advantages of all preceding modes. His definitions were a vast improvement upon

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upon those of his predecessors, and his specific names, associated therewith, made them current coin. Rivinus designed his names for specific distinctions, for which their necessary brevity renders them totally inadequate. If they convey additional information, respecting circumstances not so properly admissible into the scientific character, we cannot but esteem them so much the better. It seems a strange doctrine, which some writers have advanced, that names are the better for signifying nothing. Linnæus however was so much afraid of these specific names supplanting the specific definitions, or essential differences, that he cautiously denominated them trivial names, as designed merely for common use or convenience. Hence he frequently chooses them from some obvious character, which may strike a common observer sooner than more important marks; and he has continual recourse to the medical or economical appellations, or uses, of plants for his specific names. By this means the arts and sciences go hand in hand. In other instances he promotes a knowledge of the history of botany, and associates the ancient writers with the modern, by retaining some celebrated synonym, or some allusive word, for the name of a long-known species. Whether we allow Rivinus or Linnæus the merit of inventing these short specific names, there can be no doubt that their adoption has contributed, more than any other circumstance, to the popularity, and practical facility, of the Linnæan system. This is universally felt and acknowledged. Their application to Zoology has been equally beneficial, and some of the contrivances of the great Swedish naturalist in the nomenclature of animals, particularly insects, are amongst the happiest efforts of his genius. His friend and fellow-labourer in this particular department of natural history, the great Bergmann, seized the fortunate idea for his own use in chemistry, and contrived to express in two words the essential characters, or chemical combinations, of the productions with which that science is conversant. How wise and advantageous this invention has been, the most superficial admirer, as well as the deepest philosopher, is every moment conscious.

In speaking of botanical nomenclature, we ought not to omit mention of the most singular attempt of the kind, by Dr. de Wolf of Dantzic, who published, in 1776, an octavo volume, entitled *Genera Plantarum vocabulis characteristicis definita*. His plan is, to adapt some particular letter to each character, so that the generic name of a plant shall be an assemblage of the letters that express all its technical characters. The first syllable is to comprise what regards the fruit; the following one or more the integuments of the flower. A consonant before a vowel expresses substance, or figure, and situation; a vowel number and division. Such names however are barely possible to be pronounced, and impossible to be remembered. We shall give one of his examples. B stands for a berry, æ for several seeds in two cells. A five-cleft stellated corolla is expressed by *li*; a conical five-cleft calyx by *vi*. Hence is formed the word *Bæliwi*, for *Solanum*. A stands for one pistil; *a* for one stamen; *i* for five distinct stamens; so that *Ai* prefixed to *Bæliwi*, expresses the order and class of the genus in question. The names of genera nearly allied are, of course, the most similar, but for that very reason the most hard to distinguish or remember. Thus *Wýsom* is *Polianthes*, *Wýfor* *Crinum*, *Wýfær* *Pontedera*, *Wýpo* *Hyacinthus*, *Wýhop* *Cyanella*, &c. *Wivii* is *Dicamnanus*, *Witwi* *Rhodora*, *Wivira* *Ledum*, *Wipii* *Pyrola*, *Wiriwi* *Ruta* with a five-cleft flower, *Wilwi* *Swietenia*, *Wiwipi* *Zygophyllum* with a five-cleft flower, *Wriwii* *Tribulus*, *Wiliwi* or *Wóówo*, according as the flowers are five

or six-cleft, *Clusia*. *Wq̄wq̄q̄* is *Semprevivum*, *Wq̄mtwi* *Isopterum*, *Wq̄mq̄wq̄* *Trollius*, and *Wq̄wtwi* *Dillenia*. By these examples it will be perceived, that the author follows the artificial system of arrangement, and that his names defy even the accentual powers of a Person. We cannot however deny him the praise of ingenuity and application. Let all who devote those qualities to the pursuit of originality, at the expence of every other consideration, come and lay their laurels at his feet. S.

NOMENCLATURE, is a term employed to denote the language peculiar to any particular science, or art.

It is to the modern nomenclature of *Chemistry*, so admirable both for its ingenuity and comprehensiveness, that the rapid progress which has been made in this department of philosophy, during the last five and twenty years, is, in a great measure, to be ascribed. Nor need we be surprised at this, for, "as ideas are preserved, and communicated by means of words, it necessarily follows, that we cannot improve the language of any science, without at the same time improving the science itself; neither can we, on the other hand, improve a science, without improving the language, or nomenclature, which belongs to it. However certain the facts of any science may be, and however just the ideas we may have formed of these facts, we can only communicate false or imperfect impressions of these ideas to others, while we want words by which they may be properly expressed." Such is the remark of the celebrated Lavoisier, and in all the circumstances attendant on the reform in the science and language of chemistry, his reasoning is most fully verified. The grand outline of the modern nomenclature was sketched and delivered to the world by Fourcroy, Morveau, Berthollet, and himself. This took place in the year 1787, and the changes which have since been made have all been of that trifling nature, as to leave the basis of the system, founded by these philosophers, entire and undisturbed. Their first step was to give to each of the substances supposed to be uncompounded, or elementary, simple and appropriate names. In most instances they adopted those that had been long in use, it having been made a law by them, "scrupulously to preserve the ancient names in all cases wherein the subject, denominated and long known, presented in its ancient denomination no one of the vices which they were desirous of avoiding." But the discovery of the constituent parts of water, and of the atmosphere, rendered the adoption of certain new titles necessary, and in constructing these, they were guided by some prominent peculiarity presented by each of the elementary bodies. The two ingredients, for example, of which water is composed, received the appellations of *oxygen* and *hydrogen*; in consequence of the former possessing the exclusive power of imparting *acidity* to certain of its combinations, and from the latter being the "generative principle" of *water*. The roots in those cases from which the derivation is effected, were the Greek words *ὀξύς*, *acidum*, and *ὕδωρ*, *aqua*, the verb *γίνομαι*, *gignor*, being added to each. In all the additions which have been subsequently made to the elementary catalogue, the principle thus laid down has, either in letter or spirit, been uniformly acknowledged. It was not in every instance that the characteristic properties of the substance were sufficiently striking to enable the discoverer to derive the proposed name from these; but in defect of such aid, either the place where the compound affording the new body was found, has suggested the term, or some other circumstance equally connected with its history. All names hereafter to be offered, which are perfectly arbitrary, should be rejected; for as the leading distinction between the nomenclature of

the old and modern school consists in the latter conveying with the name a knowledge of the constitution of the compound designated, while the former was totally regardless of such assistance, even the elementary bodies should not receive their titles without some attention to the information which may be thus communicated. That much may be accomplished by a regard to this circumstance, is evident from the names attached to the newly discovered bases of the earths and alkalies; for who, at all acquainted with the principles upon which modern chemical language is constructed, could fail to recognise in the terms *barium* and *strontium*, the bases of *barytes* and *strontian*, and in those of *potassium* and *sodium*, the bases of the two fixed alkalies? The same may be said of all the elementary bodies, which the brilliant discoveries of sir Humphrey Davy, and his followers have, within these few years, introduced to us; and we cannot too highly applaud this distinguished chemist for the earnest regard he has shewn for so important an object, in every instance when the nomenclature has been extended by him. There is no circumstance affecting the uniformity of a scientific language so apparently trifling as to deserve to be disregarded; and it is for this reason that the terminations, even of the names of the simple bodies, should, as well as their derivation, be regulated by some established rule. For the metals, the termination *um* has been chosen, and as there is nothing in the sound offensive to the genius of our language, it may very properly be adopted; especially since the Latin names of all the older ones have this ending, from their belonging to a particular variety of nouns, of which that final syllable is characteristic. To extend this termination, however, to others of the simple bodies, seems, in some degree, objectionable; and instead of *murium* and *fluorium*, therefore, which have been chosen to represent the bases of the *muratic* and *fluoric* acids, we would recommend such words as *muriogen* and *fluogen*, which are derivatives perfectly consistent with the modern system, and equally expressive of the character of their objects with the terms before mentioned. By persisting in this method, the mere ending of the word would immediately apprise us to what class of bodies any newly discovered substance might belong, or at all events, whether or not it was metallic; and this is entirely an advantage of sufficient importance to deserve attention. In naming the various compounds of chemistry, the projectors of the new nomenclature have invented a system, not liable, like the elementary substances, to the caprice of a discoverer, but definite and invariable in its principles; and while it is capable of admitting any number of compounds that may be added, conveys immediately to the mind a knowledge of the constitution of the substance which it is employed to represent, without that effort of memory necessary for the interpretation of the language of the older chemists. The simplest form of combination is the union of the inflammable elements with each other. When these elements are metals, the combinations are termed *alloys*, except in those cases where mercury is employed, and the resulting compound then is denominated an *amalgam*. For the other combinations of this class, where one of the bodies only is a metal, or has a metallic base, a different form of expression is provided, the termination *uret* being given to the substance with which the metallic base is united. The combinations of sulphur, for instance, are denominated *sulphurets*; of phosphorus, *phosphurets*; of carbon, *carburets*; and of hydrogen, *hydurets*. The union of sulphur with iron, being a *sulphuret of iron*, and, in like manner, of the rest. The rule in this, and all other instances, is, that whichever of the ingredients is called the *base*, the name of that remains unchanged; and it is to this

circumstance that an apparent anomaly in the case of hydrogen, which is occasionally found in both conditions, is to be ascribed. Sulphur, phosphorus, and carbon, never present themselves in any mixture with the other simple inflammables, so that they do not impart to the resulting compound the name either of a *sulphuret*, a *phosphuret*, or a *carburet*. They never act as *bases* in this class of combinations. But otherwise is the case with hydrogen, which, in many instances, assumes the part of base, and, with each of the three inflammable elements last mentioned, forms aeriform compounds, styled, agreeably to the above law, *sulphuret of hydrogen*, *phosphuret of hydrogen*, and *carburet of hydrogen*; but more commonly, though less properly, distinguished by the titles of *sulphuretted*, *phosphuretted*, and *carburetted* hydrogen. Every compound which exists in a permanently aeriform state, at all known temperatures, is called a *gas*: the substances just spoken of, therefore, are *gases*; and the adjectives *gaseous* and *gassy* are also employed as expressive of the same state. The next form of combination, of which it will be necessary to speak, is the union of the inflammable elements with oxygen. This latter body, though not combustible itself, is the only *supporter of combustion* with which we are acquainted, and occupies a place, as the sole member of a class having that title. An additional element has recently been held out as possessing these properties; but the subject has occasioned much controversy, and the weight of evidence seems at present to preponderate against the innovation insisted upon. For farther information on this point, the reader is referred to the articles MURIATIC and OXY-MURIATIC *Acids*. The name of the compound, into which oxygen enters as an ingredient, varies according to the nature of the properties exhibited by the product. When the product is an acid, it then receives a title determined by the acidified substance; but in every other case, the compound is merely termed an *oxyd*. In the union of oxygen with lead, for example, the result not being an acid, the substance obtained is called an *oxyd of lead*; and as different *doses*, or quantities, of oxygen may unite with the same element, these are distinguished either by the terms *first oxyd*, *second oxyd*, and so on; or by prefixing derivatives from the Greek, as *protoxyd*, *deutoxyd*, from *πρῶτος*, *primus*, and *δεύτερος*, *secundus*; and in the same manner with the rest. The combination of oxygen with elements capable of being acidified produces acids, which also receive a distinction according to the dose of oxygen they contain. The first dose of oxygen which unites with sulphur gives existence to a compound, not possessing acid properties. This, therefore, is merely an *oxyd of sulphur*. The second dose, however, produces an acid; and the addition of a third quantity, another acid still more powerful. According to the modern nomenclature, these are styled the *sulphurous* and *sulphuric* acids; the terminations *ous* and *ic* being used to express the lower and higher states of acidification. In all the preceding cases, the inflammable element is called the *base*; and the words *oxydate*, *oxydation*, *oxygenate*, *oxygenation*, *oxydize*, and *oxydizement*, are employed as different powers of the word *oxyd*, according to the grammatical value which it may be wished to impart to it. The next change in the nomenclature arises from the combinations of the acids. These never unite with the inflammable elements simply, nor until these elements have been previously combined with oxygen. Their products are then called *salts*, and the inflammable substance is termed their *base*. If the acid in combination with the base be in the lower state of acidification, as the *sulphurous*, for example, the termination *ite*, or *ii*, forms the characteristic of the class, added to the first syllable of the acid. Thus,

the union of sulphurous acid with potash is a sulphite of potash; of nitrous acid with the same base, a nitrite; and of phosphorous acid, a phosphite. When the acid is at the *maximum* of acidification, the termination *at* is chosen, as *sulphat*, *nitrat*, *phosphat*. Since salts, however, may be composed of different proportions of the same acid and base, to point out this, a farther provision is required; and the atomic system, concerning which much will be found under the various chemical articles of this work, furnishes the most correct means of supplying the deficiency. According to the principles of this doctrine, bodies can unite only in certain definite proportions, determinable by the number of *atoms*, or *particles*, which combine to form the particular compound. In the case of salts, the uniting atoms are already *compounded*, being made up of the elementary atoms which compose the acid and base. This, however, makes no difference in the law. The simplest and most regular form of combination is when they unite one to one. All those salts, therefore, which are constituted in this proportion, will receive the name before assigned, without any additional distinction. Thus, when an atom of lime unites with an atom of sulphuric acid, the product is a sulphat of lime; but if two atoms of base be attached to one of acid, it is then proposed that the word *sub* should be prefixed; and if two atoms of acid to one of base, the word *super*. This will not only immediately convey to the mind the condition of the salt, but, with the additional information which the atomic doctrine affords, at the same time apprise us of the exact quantity of acid and base of which a given weight of the salt is composed. The terms *sub* and *super* have long been in use, to denote an excess or deficiency of base; but have never been employed with that system, or regularity, so indispensable to the efficiency of a scientific language. In many cases, therefore, the application of them, as here recommended, it may be expected, will be at variance with former practice; and of this, the name usually attached to the *salt of tartar* of the shops, suggests itself as an immediate proof. This substance has long been known under the title of *sub-carbonat of potash*, either from the supposition that it contained an excess of base, or to distinguish it from a crystallized combination of the same sort, which, from the circumstance of its being *crystallized*, was conceived to be the more perfect form of the salt. Which ever might have been the reason, since the atom of this compound is evidently constituted of one atom of carbonic acid, and one of potash, it will, in conformity with the above rule, be denominated a *carbonat of potash*; the crystallized variety being a *super-carbonat*. Other instances might be selected, but as a slight acquaintance with the principles of the atomic philosophy will be sufficient for their detection, it will be unnecessary to extend the subject here. In the formation of salts, when an acid has taken up as much of any particular base as it can dissolve, it is said to be *saturated*; and the solution containing it is called a *saturated solution*. The word *neutral* is also used to express the same state; and all salts, the acid and base of which have lost those properties which distinguished them when uncombined, are termed *neutral salts*. If the acid should be in excess, and impart a sour taste to the product, the compound is usually said to be *acidulous*.

Respecting the orthography of chemical language, there is considerable difference of opinion. By some authors, the words are written according to the precise spelling introduced by the French inventors. This, however, is offensive to the idiom of our tongue, and frequently inconsistent with the acknowledged rules for regulating such cases, in words similarly derived. The most common instances of the prac-

tice here complained of are the addition of a final *e* to the leading names of salts, as *sulphate*, *phosphate*, &c.; and the substitution of *i* for *y*, in the words *oxygen*, *hydrogen*, *oxyd*, &c. Concerning the first of these, it may be sufficient to say, that however consonant it may be with the general construction of the *French* language to add an *e* in cases like the preceding, the spirit of *our own* directly forbids such a form of word. The pronunciation alone is sufficient to shew this; and nothing but the most servile copying of the original nomenclature could have introduced the practice amongst us. Respecting the latter, the common rule, in derivations, of rendering the Greek *υ* into English by *y*, justifies the objection here made. Established methods of this sort ought never to be deviated from, except for very ample reasons; and in the instance now under remark, caprice alone can have dictated the alteration.

NOMENTUM, *La Mentana*, in *Ancient Geography*, a town of Italy, in Latium. Pliny and Virgil have mentioned this town, which gave name to a Roman way, which passed by it from Rome, and joined the Salar way at Eratum. The ruins of this town occupy a considerable extent.

NOMENY, in *Geography*, a town of France, in the department of the Meurthe, and chief place of a canton, in the district of Nancy; 6 miles E. of Pont à Mousson. The place contains 1331, and the canton 15,833 inhabitants, on a territory of 285 kilometres, in 45 communes.

NOMI, a town of Japan, in the island of Nippon; 16 miles S.E. of Kanazawa.

NOMII, in *Ancient Geography*, a mountain of Arcadia, on which was a temple consecrated to the god Pan, the Nomian, according to Pausanias, l. viii. c. 38.

NOMINA VILLARUM an account of the names of all the villages, and the possessors thereof, in each county, drawn up by several sheriffs, at the instance of king Edward II., and returned by them into the exchequer; where it is still preserved.

NOMINAL CHARACTERS. See CHARACTER.

NOMINALS, or NOMINALISTS, a sect of school-philosophers, the disciples and followers of Occam, or Ocham, an English Cordelier, in the 14th century.

The Nominalists were great dealers in words; whence they were vulgarly denominated *word-sellers*.

They had the denomination Nominalists, because, in opposition to the Realists, they maintained, that words, not things, were the object of dialectics.

This sect had its first rise towards the end of the 11th century, and pretended to follow Porphyry and Aristotle; but it was not till Occam's time that they bore the name. The chief of this sect, in the 11th century, was a person called John, who, on account of his logical subtilty, was called the Sophist, and his principal disciples were Robert of Paris, Rosceline of Compeigne, and Arnoul of Laon.

Porphyry, in his introduction to the Aristotelian logic, says, "Concerning genera and species, whether they have a real essence, or are barely conceptions of the mind, and if they subsist, whether corporeally or incorporeally, whether spiritually or only in the objects of sense, I give no opinion, because the subject is abstruse, and requires a larger discussion." This point, which Porphyry left undetermined, was resumed in the schools, and the opinion of Aristotle, that universals subsist not prior to individual bodies, nor after them, but within them, and are the forms eternally united to matter, which make bodies to be such as they are, universally prevailed, till, in the 11th century, Rosceline adopted the Stoic opinion, that universals have no real existence either before or in individuals, but are mere names

or words by which the kinds of individuals are expressed; a tenet which was afterwards propagated by Abelard, and produced the sect of the Nominalists. This new opinion gave great offence to the philosophers and divines of the 11th century, perhaps chiefly because Rosceline, by applying it to the doctrine of the Trinity, brought upon himself a suspicion of heresy. Many young persons, however, strenuously adhered to the side of the Nominalists; and the sect, through the ingenuity and ability of Abelard and others, obtained many followers. Some of these, to avoid censure, changed their ground so far as to maintain, that universals consist in notions and conceptions of the mind, formed by abstraction; whence they were called *Conceptualists*. (See that article.) The Realists, too, were of different opinions, some leaning towards the doctrine of Plato, and others towards that of Aristotle. In the 12th century, the controversy still continued.

At the beginning the Nominals had the upper hand: but the Realists, though greatly divided among themselves, were supported by men of great abilities; such as Albertus Magnus, T. Aquinas, and Duns Scotus. The Nominal sect became hereby into disrepute; till William Occam, in the fourteenth century, again revived it, and filled France and Germany with the flame of disputation. This sect, enjoying the countenance and favour of Louis XI., almost universally flourished in Germany. Having joined the party of the Franciscan monks, who strenuously opposed John XXIII. that pope himself, and his successors after him, left no means untried to extirpate the philosophy of the Nominalists, which was deemed highly prejudicial to the interests of the church: and hence it was, that in the year 1339, the university of Paris, by a public edict, solemnly condemned and prohibited the philosophy of Occam, which was that of the Nominalists. The consequence was, that the Nominalists flourished more than ever. In the fifteenth century, the controversy was continued with more vigour and animosity than ever; and the disputants were not content with using merely the force of eloquence, but had frequently recourse to more hostile and dangerous weapons; and battles were the consequence of a philosophical question, which neither side understood. In most places, however, the Realists maintained a manifest superiority over the Nominalists. While the famous Gerson, and the most eminent of his disciples were living, the Nominalists were in high esteem and credit in the university of Paris. But upon the death of these patrons, the face of things was much changed to their disadvantage. In the year 1474, Lewis XI. by the instigation of his confessor, the bishop of Avranches, issued out a severe edict against the doctrines of the Nominalists, and ordered all their writings to be seized and secured, that they might not be read by the people, requiring the academic youth to renounce their doctrines: upon this, the leaders of the sect fled into Germany and England, whence, at the beginning of the Reformation, they met with a strong reinforcement, in Luther, Melancthon, and others. However, the same monarch mitigated this edict the year following, and permitted some of the books of that sect to be delivered from their confinement. In the year 1481, he not only granted a full liberty to the Nominalists and their writings, but also restored that philosophical sect to its former authority and lustre in the university. Mosheim, vol. iii. 8vo. Brucker's Phil. by Enfield, vol. ii.

The Nominalists were the founders of the university of Leipsic: there are many yet abroad who pique themselves on being Nominals.

The Nominals, with the Stoics, admit the formal conceptions or ideas of things, as the subject and foundation of

universality; but to this they add names, which represent and signify, after the same univocal manner, and without any distinction, a great variety of single things alike in genus and species.

Whence it is that they are called Nominals; as pretending, that to become learned, it is not enough to have just ideas of things, but it is likewise required to know the proper names of the genera and species of things, and to be able to express them clearly and precisely, without confusion or ambiguity. See REALISTS.

NOMINATION, the act of naming and appointing a person for some function, employ, or benefice.

The word is chiefly used for the right of presenting to a benefice, &c.

In common law, however, there is a difference between *nomination* and *presentation*; the former being properly a power which a man has, by virtue of a manor, or otherwise, to appoint or name a clerk to a patron of a benefice, to be by him presented to the ordinary. See PRESENTATION.

NOMINATIVE, in *Grammar*, the first case of nouns which are declineable.

The simple position, or laying down of a noun, or name, is called the *nominal case*: yet it is not so properly a case, as the matter or ground whence the other cases are to be formed, by the several changes and inflections given to this first termination. See CASE.

Its chief use is to be placed in discourse before all verbs, as the subject of the proposition, or affirmation; as *Dominus regit me*, the Lord governs me; *Deus exaudit me*, God hears me.

NOMINATOR, he who names or presents a person to an office, or benefice.

Hence *nominee*, the person named or presented.

Errard observes, that there are some customs where the nominator is responsible for the solvibility of the nominee.

NOMINE PÆNÆ, in *Law*, is a penalty incurred for not paying rent, &c. at the day appointed by the lease or agreement, for the payment thereof.

NOMINIS IDENTITATE. See IDENTITATE.

NOMION, in *Musick*, a kind of love-song with the Greeks.

NOMIQUE, NOMICAL *Mode*, or that kind of style in music which was sacred to Apollo, god of verse and song, in which every effort was tried to render it brilliant, and worthy of the divinity to whom it was consecrated. See MODE, MELOPEIA, and STYLE.

NOMISNY BAY, in *Geography*, a bay on the river Potomack, on the coast of Virginia. N. lat. 38° 11'. W. long. 76° 50'.

NOMOCANON, compounded of *νομος*, law, and *κανων*, canon, or rule, a collection of canons, and of imperial laws relative or conformable thereto. See CANON.

The first nomocanon was made by Johannes Scholasticus, in 554. Photius, patriarch of Constantinople in 883, compiled another nomocanon, or collation of the civil laws with the canons: this is the most celebrated. Balsamon wrote a commentary on it in 1180.

NOMOCANON also denotes a collection of the ancient canons of the apostles, councils, and fathers; without any regard to imperial constitutions.

Such is the nomocanon published by M. Cotelier.

NOMOCANON is sometimes also used for a *penitential* book of the Greeks.

NOMOPHYLACES, *Νομοφυλακες*, among the Athenians, magistrates who were to see the laws executed, being not unlike to our sheriffs. They had the execution of criminals

minals committed to their care, as also the charge of such as were confined prisoners. They had also power to seize thieves, kidnappers, and highwaymen, upon suspicion; and, if they confessed the fact, to put them to death: if not, they were obliged to prosecute them in a judicial way.

NOMOPHYLACES were likewise officers belonging to the Olympic games, whose business it was to instruct those who were to contend in all the laws of the games. See *HELLENODICÆ*.

NOMOTHETÆ, Νομοθέται, among the Athenians, were a thousand in number, and chosen by lot out of such as had been judges in the court *Helizæ*. Their office was not (as their name seems to imply) to enact new laws by their own authority, for that could not be done without the approbation of the senate, and the people's ratification; but to inspect the old, and, if they found any of them useless, or prejudicial, as the state of affairs then stood, or contradictory to others, they caused them to be abrogated by an act of the people. Besides this, they were to take care that no man should plough, or dig deep ditches within the Pelasgian wall; to apprehend the offenders, and send them to the archon.

NO NEARER, in *Sea Language*, is the command given by the pilot or quarter-master to the helmsman, to steer the ship no nearer to the direction of the wind than the sails will operate to advance the ship in her course.

NON, or NUN, in *Geography*, a city of Africa, in the province of Vled de Non, belonging to the empire of Morocco, two days' journey from the sea-coast, and opposite to the cape of the same name.

Non, or Nun, Cape, a cape of the same province, discovered by the Portuguese in the beginning of the fifteenth century, and so named by them, because those who doubled it first never returned. N. lat. $28^{\circ} 38'$. W. long. $11^{\circ} 5'$.

NON, *Vled de*. See *VLED de Non*.

NONA, *ÆNONA*, a mean sea-port town and bishop's see of Dalmatia, situated on a small island, surrounded by a harbour formerly capable of receiving large ships, but now a fetid pool, at the mouth of a small muddy river. No vestige remains of the grandeur of the Roman times, nor any traces of its barbarous magnificence, when it was the residence of the kings of the Croat Slavi; 28 miles N.W. of Scardona. N. lat. $44^{\circ} 28'$. E. long. $15^{\circ} 35'$.

NON-ABILITY, in *Law*, an exception taken against the plaintiff in a cause, on some just ground why he cannot commence a suit in law; as præmunire, outlawry, being professed in religion, excommunicate, or a stranger-born. This last holds only on actions real, and mixed: and not in personal, except he be both a stranger and an enemy. The civilians say, that such a man hath not *personam standi in judicio*. See *DISABILITY*.

NON-ADMITTAS. See *NE Admittas*.

NONÆ and *Decimæ*, were payments anciently made to the church by those who were tenants of church-farms.

The *nonæ* were a rent or duty claimed for things belonging to husbandry; the *decimæ* were claimed in right of the church.

NONAGE, in *Law*, an incapacity of doing certain things from want of age.

The term of *nonage* is different, with regard to different things. In matters of inheritance, a man is in his nonage till twenty-one years; for marriage only to fourteen, &c. See *AGE* and *MINOR*.

NONAGE, *Nonagium*, also denotes the ninth part of a man's moveable goods, anciently paid in the nature of a mortuary; being claimed by the clergy upon the death of those of their parish.

At first this was a third part of the goods, and was called *tertiagium*; till by a bull of Clement VI. it was reduced to a ninth.

NONAGESIMAL, in *Astronomy*, the ninetyeth degree of the ecliptic, reckoned from its eastern term, or point.

The altitude of the nonagesimal is equal to the angle of the east; and, if continued, passes through the poles of the ecliptic: whence the altitude of the nonagesimal, at a given time, under a given elevation of the pole, is easily found.

If the altitude of the nonagesimal be subtracted from 90° , the remainder is the distance of the nonagesimal from the vertex.

NONAGON, a figure having nine angles and sides.

NONAME, in *Geography*, a lake of North America, extending from N. lat. 60° about 50 miles N., and about 35 miles from E. to W., abounding with fine fish.

NONANCOURT, a town of France, in the department of the Eure, and chief place of a canton, in the district of Evreux; 7 miles W. of Dreux. The place contains 1145, and the canton 9019 inhabitants, on a territory of $172\frac{1}{2}$ kilometres, in 15 communes.

NONANT, a town of France, in the department of the Orne; 18 miles N. of Argentan.

NONANTALA, a town of Italy, in the department of the Panaro; 10 miles N.E. of Modena.

NON-APPEARANCE, in *Law*, a default in not appearing in a court of judicature. See *APPEARANCE*.

NONASPE, in *Geography*, a town of Spain, in Aragon; 18 miles E. of Alcaniz.

NON-ASSUMPSIT, in *Law*, a plea in personal actions, whereby a man denies any promise made, &c. or that he made any such promise within six years, which is an effectual bar to the complaint.

NONATELIA, in *Botany*, a genus of Aublet's, so called from the name given it by the natives of Guiana, *Nono ateli*. Aubl. Guian. v. 1. 182. t. 70-74. Juss. 205. Lam. Illust. t. 155. (Oribasía; Schreb. 123.)—This genus, which claims attention from the virtues attributed to an infusion of the leaves of one of its species, in the asthma, is referred by Schreber, p. 822, to *PSYCHOTRIA*. See that article.

NON-CLAIM, in *Law*, the omission or neglect of him who challenges not his right within the time limited by law: as, within a year and a day, where continual claim ought to be made. See *CLAIM*.

By such neglect he is either barred of his right; as upon non-claim within five years after a right accrued to him; or of his entry by descent, for want of a claim within five years after the disseisin. An infant shall lose nothing by non-claim, or neglect of demanding his right. See *FINE*.

NON COMPOS MENTIS, a phrase denoting a person not to be of sound memory or understanding.

Of this, in common law, there are said to be four kinds. First, an idiot born; secondly, he that by accident loseth his memory and understanding; thirdly, a lunatic, that has *lucida intervalla*, sometimes understanding, and sometimes not; fourthly, he that by his own act, for a time, depriveth himself of his right senses, as a drunkard. But this last kind shall give no privilege to him, or his heirs.

A descent takes away the entry of an idiot, though the want of understanding were perpetual. Under the general name of "*non compos mentis*," which Sir Edward Coke says (1 Inst. 24.) is the most legal name, are comprised not only lunatics, but persons under frenzies; or who lose their intellects by disease; those that become deaf, dumb, and blind, not being born so; or such, in short, as are judged by the

court of chancery incapable of conducting their own affairs. To these, as well as to idiots, the king is guardian; and the law, always imagining that these accidental misfortunes may be removed, only constitutes the crown a trustee for these unfortunate persons, to protect their property, and to account to them for all profits received, if they recover, or after their decease, to their representatives. (17 Edw. II. c. 10. See LUNATIC.) On the first attack of lunacy, or other occasional insanity, while there may be hopes of a speedy restitution of reason, it is usual to confine the unhappy objects in private custody, under the direction of their nearest friends and relations; and the legislature, to prevent all abuses incident to such private custody, hath thought proper by statute to interpose its authority for regulating private mad-houses. (See MAD-HOUSE.) But when the disorder is grown permanent, and the circumstances of the party will bear such additional expence, it is proper to apply to the royal authority to warrant a lasting confinement. The method of proving a person "non compos," is very similar to that of proving him an idiot. The lord chancellor, to whom, by special authority from the king, the custody of idiots and lunatics is entrusted (3 P. Wms. 108.), upon petition or information, grants a commission in nature of the writ *de IDIOTA inquirendo*, to inquire into the party's state of mind; and if he be found "non compos," he is treated in the manner already described under the article LUNATIC. Persons that are "non compos," are incapable of making a will, as long as such disability lasts. In criminal cases such persons are not chargeable for their own acts, if committed when under these incapacities; not even for treason itself. 3 Inst. 6. See LUNATIC.

NON-CONFORMISTS is a general denomination comprehending all those who do not conform to the established worship of the church. These are of two sorts, *viz.* 1. Such as absent themselves from it through total irreligion, and attend the service of no other persuasion: who by 1 Eliz. cap. 2. 23 Eliz. cap. 1. and 3 Jac. I. c. 4. forfeit one shilling to the poor every Lord's day they so absent themselves, and 20*l.* to the king if they continue such default for a month together: and if they keep any inmate thus irreligiously disposed, in their houses, they forfeit 10*l.* per month. And 2. Such as absent themselves from the worship of the established church, under the plea of conscience; and these are Protestant dissenters, to whom the term is commonly applied, and Papists. See TOLERATION.

The word is said to have had its rise from a declaration of king Charles I., who appointed that all the churches of England and Scotland should have the same ceremonies and discipline; the acquiescence wherein, or dissenting from which, determined *conformity* and *non-conformity*.

But this distinction primarily related to the rites of worship and ecclesiastical laws, enacted by Edward VI. Those who complied with them were *Conformists*, and those who objected *Non-conformists*. See PURITANS.

NONCOVERY, in *Geography*, one of the Nicobar islands, S.E. of Camorta, separated from it by an arm of the sea, which might be made an useful harbour. The island is of a triangular form, of no great extent, and covered with wood. The inhabitants are few, and the produce, timber and hogs excepted, of inconsiderable importance. The island abounds with lime-stone. N. lat. 8° 5'. E. long. 94° 2'.

NONDAL, a town of Sweden, in the province of Finland; 10 miles W.N.W. of Abo.

NON DAMNIFICATUS, in *Law*, is a plea to an action of debt upon a bond, with condition to save the

plaintiff harmless. (Abr. 224.) If the condition of a bond be to save harmless only, *non damnificatus* is generally a good plea; but if it be to discharge the plaintiff, &c. then the manner of the discharge is to be shewn.

NON DECIMANDO. See *MODUS Decimandi*.

NON DISTRINGENDO, a writ not to distrain, used in divers cases.

NONDORF, in *Geography*, a town of Austria; 6 miles N.W. of Sonneberg.

NONE, a town of France, in the department of the Po, at the conflux of the rivers None and Riotorto; 7 miles S.S.W. of Turin.

NONE, or *Nones*, *Nonæ*, one of the seventh canonical hours, in the Romish church. See HOUR.

None, or the ninth hour, is the last of the lesser hours, that is said before vespers; and answers to three o'clock in the afternoon.

This single office, and that for the dead, ends at nones; which, father Rosweyd observes, was anciently the hour for the breaking up of the synaxis, or usual meetings at church of the primitive Christians.

The hour of none was also the usual time for taking the repast on fast-days; though some would keep the fast till night.

NONES, *Nonæ*, in the *Roman Calendar*, the fifth day of the months January, February, April, June, August, September, November, and December; and the seventh of March, May, July, and October: these four last months having six days before the nones, and the others only four.

The word apparently has its rise hence, that the day of the nones was nine days before the ides, and might be called *nono-idus*.

March, May, July, and October, had six days in their nones; because these alone, in the ancient constitution of the year by Numa, had thirty-one days a-piece; the rest have only twenty-nine, and February thirty. But when Cæsar reformed the year, and made other months contain thirty-one days, he did not likewise allot them six days of nones.

NON-ENTITY, whatever has no real being, or is only conceived negatively, or claims only a negative denomination. See ESSE, ESSENCE, &c.

NONE-SO-PRETTY, in *Botany*. See SAXIFRAGA.

NON-ESSENTIAL MODES. See MODES.

NON EST CULPABILIS, *NON Cul. q. d. he is not guilty*, in *Law*, the general plea to an action of trespass, whereby the defendant absolutely denies the fact charged on him by the plaintiff: whereas, in other special pleas, the defendant grants the fact to be done, but alleges some reasons in his defence, why he lawfully might do it.

As *non cul.* is the general answer in an action of trespass, *i. e.* a criminal action civilly prosecuted; so is it in all actions criminally followed, either at the suit of the king, or others, wherein the defendant denies the crime objected to him.

NON EST FACTUM, is an answer to a declaration, whereby a man denieth that to be his bond or deed, whereupon he is impleaded.

NON EST INVENTUS, is the sheriff's return to a writ, when the defendant is not to be found in his bailiwick. And there is a return that the plaintiff, *non invenit plegium*, on original writs. Shep. Epit. 1129.

NONESUCH, in *Geography*, a river of America, in the province of Maine, which runs into the sea, N. lat. 43° 30'. W. long. 70° 20'.—Also, one of the smaller Bermuda islands.

NONESUCH

NONESUCH Harbour, a harbour on the E. coast of Antigua. N. lat. 43° 30'. W. long. 61° 23'.

NON IMPLACITANDO ALIQUEM DE LIBERO TENEMENTO SINE BREVI, in *Law*, a writ to prohibit bailiffs, &c. from distraining any man touching his freedom, without the king's writ.

NON INTROMITTENDO QUANDO BREVE PRÆCIPE IN CAPITIS SUBDOLE IMPETRATUR, a writ directed to the justices of the bench, or in eyre, commanding them not to give one that had, under colour of intitling the king to land, &c. as holding of him *in capite*, deceitfully obtained the writ called *præcipe in capite*, any benefit thereof, but to put him to this writ of right. (Reg. Orig. 4.) This writ having dependence on the court of wards, since taken away, is now disused.

NON JURIDICI DIES. See **DIES**.

NON-JURORS, are persons that refuse to take the oaths to the government, who are liable to certain penalties; and for a third offence to abjure the realm, by 13 & 14 Car. II. cap. 1. Parsons, vicars, &c. are to take the oaths, and give their assent to the declaration (14 Car. II. cap. 4.) or they shall not preach, under the penalty of 40*l.* &c. (Stat. 17 Car. II. cap. 2.) Ecclesiastical persons not taking the oaths on the Revolution, were rendered incapable to hold their livings: but the king was empowered to grant such of the nonjuring clergy as he thought fit, not above twelve, an allowance out of their ecclesiastical benefices for their subsistence, not exceeding a third part. (1 W. & M. sess. 1. cap. 8.) Persons refusing the oaths shall incur, forfeit, and suffer the penalties inflicted on Popish recusants, and the court of exchequer may issue out process against their lands, &c. 7 & 8 Will. III. cap. 27. See the stat. 2 Geo. I. cap. 13. and **OATHS**.

The non-jurors, or high-church men, were particularly distinguished by the following principles: 1. They maintained the doctrine of passive obedience. 2. That the hereditary succession to the throne is of divine institution, and, therefore, can never be interrupted, suspended, or annulled, on any pretext. 3. That the church is subject to the jurisdiction, not of the civil magistrate, but of God alone, particularly in matters of a religious nature. 4. That, consequently, the bishops deposed by king William III. remained, notwithstanding their deposition, true bishops to the day of their death; and that those who were substituted in their places were the unjust possessors of other men's property. 5. That these unjust possessors of ecclesiastical dignities were rebels against the state, as well as schismatics in the church, and that all, therefore, who held communion with them, were also chargeable with rebellion and schism. And, 6. That this schism, which rends the church in pieces, is a most heinous sin, whose punishment must fall heavy on all those who did not return sincerely to the true church, from which they have departed. See *High Church*.

NONIUS, MARCELLUS, in *Biography*, a grammarian and peripatetic philosopher, who flourished about the fourth century, was a native of Tibur, now Tivoli. He is known by a work, entitled "*De Proprietate Sermonis*," now extant, and which has gone through several editions, of which the best is that printed at Paris in the year 1614. The author, says the writer of the article in the *Biographical Dictionary*, has little claim to the praise of accurate learning or judgment, and the work itself is chiefly valuable for the passages which he cites from authors no where else to be met with.

NONIUS, PETER, in Spanish *Nunez*, a learned Portuguese, and one of the ablest mathematicians of the sixteenth

century, was a native of Alcaccer. He was preceptor to don Henry, king Emanuel's son, and taught the mathematics in the university of Coimbra. He published the following works, by which he gained great reputation; "*De Arte Navigandi*:" Annotations in theorias planetarum Purbachii:" a treatise "*De Crepusculis*;" and "*A Treatise on Algebra*." It has been said that Peter Nonius, in 1530, first invented the angles of 45 degrees, made in every meridian, that he called them rhumbs in his language, and calculated them by spherical triangles. Nonius died in 1577, at the age of eighty: see the next article.

NONIUS is a name erroneously given to the method of graduation now generally used in the division of the scales of various instruments, and which should be called *Vernier*, from its real inventor. The method of Nonius, so called from its having been invented by Pedro Nunez, or Nonius, and described in his treatise "*De Crepusculis*," printed at Lisbon in 1542, consists in describing within the same quadrant, forty-five concentric circles, dividing the outermost into ninety equal parts, the next within into eighty-nine, the next into eighty-eight, &c. till the innermost was divided into forty-six only. By this means, in most observations, the plumb-line or index must cross one or other of those circles very near a point of division: whence by computation, the degrees and minutes of the arc might be easily computed. This method is also described by Nonius, in his treatise "*De Arte atque Ratione Navigandi*, lib. ii. cap. 6." where he would persuade himself, that it was not unknown to Ptolemy. But as the degrees are thus divided very unequally, and it is very difficult to attain exactness in the division, especially when the numbers into which the arcs are to be divided are impossible, of which there are no less than nine, the method of diagonals, first published by Thomas Digges, esq. in a treatise intitled "*Alæ seu Scalæ Mathematicæ*," printed at London in 1573, and said to be invented by one Richard Chanfeler, a very skilful artist, was substituted in its room. However, Nonius's method was improved at different times; but the admirable division now so much in use, is the most considerable improvement of it. See **VERNIER**.

NON LIQUET, it does not appear, in *Law*, a verdict given by a jury, when a matter is to be deferred to another day of trial.

The same phrase was used among the Romans: after hearing a cause, such of the judges as thought it not sufficiently clear to pronounce upon, cast a ballot into the urn with the two letters *N. L.* for *non liquet*.

NON MERCHANTIZANDO VICTUALIA, a writ to justices of assize to enquire whether the magistrates of such a town do sell victuals in gross, or by retail, during the time of their being in office, which is contrary to an ancient statute, and to punish them if they do. Reg. Orig. 184.

NON MOLESTANDO, a writ which lies for him who is molested contrary to the king's protection granted him. Reg. of Writs, 184.

NON-NATURALS, in *Medicine*, *res non naturales*, are the causes and effects of diseases, whether near or remote.

Physicians have digested all the causes of diseases into six classes, which they call the six non-naturals. These are, 1. Air. 2. Meat and drink. 3. Motion and rest. 4. The passions of the mind. 5. Excretions and retentions. 6. Sleep and waking. See each under its proper article. They are thus called, because, by their use or abuse, they become either good, *naturals*; or evil, *contra-naturals*.

But the division, in effect, is of no great use; the causes of

of diseases being much more commodiously laid down otherwise. See Boerhaave's division of the non-naturals under CAUSE.

NONNUS, in *Biography*, a Greek poet, who flourished in the fifth century, was a native of Panopolis in Egypt, and was author of two works, on very different subjects, but generally admitted to be from the same pen. The first, entitled "Dionysiacs," a poem of forty-eight books, contains a history of Bacchus, and is said to comprehend a vast miscellany of heathen mythology and erudition. The second is a metrical "Paraphrase of the Gospel of St. John." This is valuable, as affording some important, various readings, which have been collected by editors of the New Testament. He omits the story of the woman taken in adultery. The "Dionysiacs" were first printed at Antwerp in 1569. They were reprinted, with a Latin version, at Hanau in 1605, and afterwards by Cunæus in 1610. Of his paraphrase there have been a number of editions, but the best is that of Daniel Heinsius in 1627. Moreri.

NONO, in *Geography*, a town of Abyssinia; 100 miles S. of Miné.

NONOABA, a town of Mexico, in New Biscay; 105 miles W. of Parral.

NON OBSTANTES, *Notwithstanding*, in *Law*, a clause frequent in statutes and letters patent; importing a licence from the king to do a thing, which at common law might be lawfully done; but being restrained by act of parliament could not be done without such licence. Vaugh. 347. Plowd. 501.

All grants of such pensions, and every *non obstante* therein contained, shall be void. Henry III. took up the clause, *non obstante* (first introduced by the pope), in his grants.

But the doctrine of *non obstantes*, which sets the prerogative above the laws, was effectually demolished by the bill of rights at the revolution, and abdicated Westminster-hall when king James abdicated the kingdom. It is enacted by 1 W. & M. sess. 2. cap. 2. that no dispensation by *non obstante*, of or to any statute, or any part thereof, shall be allowed, but that the same shall be held void and of none effect, except a dispensation be allowed in such statute.

NON OBSTANTES, in the *Romish Canon-Law*, make the third part of the provisions of the court of Rome, beginning with *non obstantibus*, and comprising absolutions from censures, rehabilitations, and necessary dispensations for the enjoyment of benefices. None inferior to the pope can use the clause *non-obstante*.

NON OMITTAS, a writ which lies where the sheriff having delivered a writ or process to a bailiff of a franchise in which the party it is to be served on dwells, and the bailiff having refused or neglected to serve it, upon the sheriff's returning that he delivered it to the bailiff, this second writ shall be directed to the sheriff, charging him to enter the franchise, and execute the king's command, either by himself or officer.

NON-PAYMENT of ecclesiastical dues to the clergy, as pensions, mortuaries, compositions, offerings, and whatsoever falls under the denomination of surplice fees, for marriages or other ministerial offices of the church, is a pecuniary injury, cognizable in the spiritual courts: redressed by a decree for their actual payment. Besides which all offerings, oblations, and obventions, not exceeding the value of 40s., may be recovered in a summary way before two justices of the peace.

NON PLEVIN, *Non plevina*, a default in not replevying of land in due time. See REPLEVIN.

In Hengham Magna, it is said, that the defendant should

be sure to replevy his lands seized by the king within fifteen days; and that if he neglects, then, at the instance of the plaintiff at the next court-day, he shall lose his seisin, *sicut per defaltam post defaltam*. But, by stat. 9 Edw. III. it was enacted, that no person should lose his land thenceforward because of *non plevin*.

NON PONENDO IN ASSISIS, & JURATIS, a writ granted on divers occasions to persons for freeing them from serving on assizes and juries; as by reason of old age, charter of exemption, or the like. This writ is founded on the stats. West. 2. 13 Edw. I. ft. 1. c. 38. and articuli super chartis, 28 Edw. I. ft. 3. c. 9. F. N. B. 165. 2 Inst. 127. 447.

NON PROCEDENDO AD ASSISAM REGE INCONSULTO, a writ to stop the trial of a cause appertaining to one who is in the king's service, &c. till the king's pleasure be farther known. Reg. Orig. 220.

NON PROS, or *Non PROSEQUITUR*. See NOLLE *Prosequi* and *Non-SUIT*.

NON-RESIDENCE is applied to such spiritual persons as are not resident on, but absent themselves from their benefices or dignities. See BENEFICE.

Regularly, personal residence is required of ecclesiastical persons upon their cures; though there are some exceptions in favour of particular persons, as king's chaplains, bishops, &c. See RESIDENCE.

NON RESIDENTIA PRO CLERICIS REGIS, is a writ directed to the ordinary, charging him not to molest the clerk employed in the king's service, on account of his non-residence, in which case he is to be discharged. Reg. Orig. 58.

NON SANÆ MEMORIÆ, or *Non Sane Memorie*, is an exception taken to an act declared to be done by another, importing that it was done at a time when the party that did it was mad, or not in his proper senses. See NON COMPOS.

NON SOLVENDO PECUNIAM, *ad quam clericus multatur pro non residentia*, a writ prohibiting an ordinary to take a pecuniary mulct, imposed on a clerk of the king's for non-residence. Reg. of Writs, fol. 59.

NON SPISSUM, in the *Ancient Music*. See APYC-NON.

NONSUCH, in *Agriculture*, a term provincially applied to trefoil and rye-grass, as *black* and *white* nonsuch.

NONSUCH Clay, a particular sort of earth, which mixed with another clay brought from Worcestershire, makes a composition very useful for making the melting-pots used in the green glass making.

NON-SUIT, in *Law*, the dropping or letting fall a suit or action. Non-suit is a renunciation of a suit, by the plaintiff or demandant; most commonly upon the discovery of some error, or defect, when the matter is so far proceeded in, as that the jury is ready at the bar to deliver their verdict. The civilians term it *litis renuntiatio*.

If the plaintiff in an action neglects to deliver a declaration for two terms after the defendant appears, or is guilty of other delays or defaults against the rules of law in any subsequent stage of the action, he is adjudged *not to follow* or pursue his remedy as he ought to do, and thereupon a non-suit, or *non prosequitur*, is entered: and he is said to be *non prof'd*. And for thus deserting his complaint, after making a false claim or complaint (*pro falso clamore suo*) he shall not only pay costs to the defendant, but is liable to be amerced to the king. A *retraxit* differs from a non-suit, in that the one is negative and the other positive: the non-suit is a mere default and neglect of the plaintiff, and therefore he is allowed to begin his suit again, upon payment of costs; but a

retraxit

retrahit is an open and voluntary renunciation of his suit, in court, and by this he for ever loses his action. (See DISCONTINUANCE of *Process*.) Before the jury gave their verdict on a trial, it was formerly usual to call or demand the plaintiff, in order to answer the amercement, to which by the old law he was liable in case he failed in his suit. And it is now usual to call him, whenever he is unable to make out his case, either by reason of his not adducing any evidence in support of it, or any evidence arising in the proper county. The cases in which it is necessary that the evidence should arise in a particular county, are either where the action is in itself local, or made so by act of parliament, as in actions upon penal statutes, &c. or where upon a motion to change or retain the venue, the plaintiff undertakes to give material evidence in the county where the action was brought. (2 Black. Rep. 1039.) If upon the plaintiff's being called, neither he, nor any body for him, appears, he is non-suited, the jurors are discharged, the action is at an end, and the defendant shall recover his costs. The reason of this practice is, that a non-suit is more eligible for the plaintiff than a verdict against him; for after a non-suit, which is only a default, he may commence the same suit again for the same cause of action; but after a verdict had, and judgment consequent thereupon, he is for ever barred from attacking the defendant upon the same ground of complaint. But in case the plaintiff appears, the jury by their foreman deliver in their verdict. (See JURY.) It is enacted by the statute 14 Geo. II. c. 17, that if after issue joined, the cause is not carried down to be tried according to the course of the court, the plaintiff shall be esteemed to be non-suited, and judgment shall be given for the defendant, as in case of a non-suit. Bl. Comm. vol. iii.

NON SUM INFORMATUS. See INFORMATUS *non sum*.

NON-TENURE, a plea in bar to a real action, whereby the party (the defendant) urges, that he holdeth not the land mentioned in the plaintiff's count or declaration, or at least some part of it. Stat. 25 Ed. III. c. 16. 1 Mod. Rep. 250.

West distinguishes non-tenure into *general* and *special*. The first where one denies himself ever to have been tenant of the land in question. The second where he only alleges, that he was not tenant on the day whereon the writ was purchased.

NON-TERM, the time of vacation between term and term. See VACATION.

It was anciently called *the time or days of the king's peace*. See PEACE of *God* and *the Church*.

Among the Romans it was called *feria*, or *dies nefasti*.

NONTRON, in *Geography*, a town of France, and principal place of a district, in the department of the Dordogne; 21 miles N. of Perigueux. The place contains 2809, and the canton 12,458 inhabitants, on a territory of 275 kilometres, in 16 communes. N. lat. 45° 32'. E. long. 0° 44'.

NON USER, or NEGLECT, in *Law*, is of itself a direct and immediate cause of forfeiture in public offices, that concern the administration of justice, or the commonwealth; but non-user of a private office is no cause of forfeiture, unless some special damage is proved to be occasioned thereby. Co. Litt. 233.

NONUPLA, in the *Italian Music*, denotes a quick time, peculiar to jigs. This species of time is otherwise called *the measure of nine times*, which requires two falls of the hand, and one rise. There are three sorts of nonupla. 1. *Nonupla di semi-minime*, or *dupla sesqui quarta*, thus marked $\frac{9}{8}$, where nine crochets are to be in the bar, of which four make a semi-breve in common time, i. e. in the

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down stroke, six, and but three up; it is usually beat *adagio*. 2. *Nonupla di crome*, or *sesqui ottava*, marked thus $\frac{9}{6}$, wherein nine quavers make a bar, instead of eight in common time, i. e. six down, and three up: it is beat *presto*. 3. *Nonupla di semi-crome*, or *super setti partiente nona*, thus distinguished $\frac{9}{6}$, in which nine semi-quavers are contained in a bar, whereof sixteen are required in common time, six down, and three up: it is ordinarily beat *prestissimo*. See ADAGIO, PRESTO, and PRESTISSIMO.

Besides these, there are two other species of nonupla, for which see TRIPLE.

NONUS *Humeri Placentini*, in *Anatomy*, a muscle, called also *rotundus minor*.

NONZA, in *Geography*, a town of Corsica; 8 miles N.W. of Bastia.

NOODT, GERARD, in *Biography*, a celebrated jurist, was born in 1647 at Nimeguen, where he was educated. He particularly attached himself to the study of jurisprudence; and in the third year of his academical course, sustained two public disputations. After this he visited the universities of Leyden, Utrecht, and Franeker: at the last he took his degree of doctor of law. This was in the year 1669; and after his return to Nimeguen, he was chosen ordinary professor of law, being then only 24 years of age. In 1679 he was elected professor of law at Franeker; and in 1684 he accepted the same office at the university of Utrecht. In 1686 he removed to Leyden, where he undertook the professorship. This was his final residence: he was twice rector of that university, and died there in 1725, at the age of 78. He was laborious in his profession, and animated with a truly philosophical spirit. His writings upon some of the most important topics of jurisprudence were published collectively by himself, in a quarto volume; of which a better and enlarged edition was given at Leyden, in two volumes, folio, in 1735, with the author's life, by M. Barbeyrac. His treatises, "*De Jure Summi Imperii et Lege Regia*," and "*De Religione ab Imperio, Jure Gentium, libera*," were translated into the French language by Barbeyrac, and published separately; the latter under the title of "*Discours sur la Liberté de Conscience*." In the first of these treatises, the author supports republican principles of government; in the second, he carries toleration in matters of religion to the full extent. Moreri.

NOOGA, in *Geography*, a river of Africa, which runs into the Indian sea, S. lat. 28° 30'.

NOOGOO, one of the small Friendly islands; 3 miles N.E. of Tongataboo.

NOOGOONAMO, one of the Hapae islands; S.E. of Haano.

NOOHEEVA, or *Federal Island*, one of the Ingraham islands in the Pacific ocean. S. lat. 8° 58'. W. long. 140° 5'.

NOOK of *Land*, *Nocata Terra*. In an old deed of Sir Walter de Pedwardyn, twelve acres and a half of land were called a *nook of land*; but the quantity is generally uncertain.

NOOKEETAH, in *Geography*, a town of Bengal; 45 miles N.E. of Nattore.

NOONGOLAH, a town of Hindoostan, in Bengal; 12 miles E. of Goragot.

NOONGOTTY, a town of Hindoostan, in the circar of Sohagepour; 28 miles S.E. of Sohagepour.

NOONINGS, in *Agriculture*, a term provincially used to signify working dinner-times, or a period of rest for plough teams.

NOONAYAN, in *Geography*, a town on the west coast

of the island of Mindanao. N. lat. $7^{\circ} 40'$. E. long. $122^{\circ} 20'$.

NOONY, a town of Bengal, in the circar of Hindooa; 34 miles N. of Nagore. N. lat. 28° . E. long. $87^{\circ} 7'$.

NOOPOUR, a town of Hindooftan, in Guzerat; 55 miles E. of Surat. N. lat. $21^{\circ} 11'$. E. long. $73^{\circ} 50'$.

NOORALDGEN, a town of Hindooftan, in Lahore; 35 miles E.S.E. of Lahore.

NOORBATORNZIA, a town of Thibet; 5 miles S. of Peinom Jeung.

NOORGUNGE, a town of Hindooftan, in Oude; 6 miles W. of Fyzabad.—Also, a town in Oude; 30 miles E. of Lucknow.

NOORMEHAL, a town of Hindooftan, in Lahore; 40 miles E.S.E. of Sultanpaur.

NOORNAGUR, a town of Hindooftan, in Bengal; 22 miles N. of Comillah.

NOORPOUR, a town of Hindooftan, and capital of a district, in the subah of Lahore; 70 miles N.E. of Lahore. N. lat. $32^{\circ} 12'$. E. long. $75^{\circ} 5'$.—Also, a town of Bengal; 20 miles S.W. of Dacca. See NURPUR.

NOORT POINT, the north cape of the port of Coquimbo, in Chili.

NOOSE. See NOOZE.

NOOTKA, or *King George's Island*, in *Geography*, an island in Nootka Sound. N. lat. $49^{\circ} 35'$. E. long. $126^{\circ} 40'$.

Nootka Sound, first called by captain Cook, on his discovery of it in April, in the year 1778, "*King George's Sound*," a bay of the North Pacific ocean, on the west coast of North America; the entrance of which is situated in the east corner of Hope bay, in N. lat. $49^{\circ} 33'$, and E. long. $233^{\circ} 12'$. This sound was entered by Cook between two rocky points, lying E.S.E. and W.N.W. from each other, at the distance of between three and four miles. Within these points the found widens considerably, and extends in, to the northward, four leagues at least, exclusively of the several branches towards its bottom, which were not ascertained. The middle of the found presents a number of islands of various sizes. Here, as well as close to some parts of the shore, the depth of water is from 47 to 90 fathoms, and even more. The harbours and anchoring places, within its circuit, are numerous. The cove in which the British ships lay was on the east side of the found, and on the east side of the largest of the islands. Although covered from the sea, it is exposed to the south-east winds, which occasionally blow with destructive violence. The land that borders on the sea-coast is of a middling height, and level; but within the found, it rises every where into steep hills, terminating in round or blunted tops, with some sharp prominent ridges on their sides. Their height is moderate, and even the highest of them are entirely covered to their summits with the thickest woods, as well as every flat part towards the sea. Some few spots, which are bare, indicate the general rocky disposition of these hills. The only soil upon them is a kind of compost, produced from rotten mosses and trees, about two feet deep. The little coves in the found have beaches composed of fragments of rock, intermixed with pebbles; and they are furnished with large masses of fallen wood, driven in by the tide, together with rills of fresh water, sufficient for the use of a ship, apparently supplied from the rains and fogs that hover about the tops of the hills. The water of these rills is perfectly clear, and easily dissolves soap. The climate, as far as our navigators had any experience of it, is infinitely milder than that on the east coast of America, under the same parallel of latitude. The mercury in the thermometer, even in the

night, was never lower than 42° , and in the day it very often rose to 60° . Frost was not perceived in any part of the low ground, but vegetation had made a considerable progress. The trees, which grow very vigorously, and to a large size, are chiefly the Canadian pine, white cypresses, the wild pine, and two or three other sorts of pine less common. Of other vegetable productions there is little variety. Among the rocks, and at the verge of the woods, were found strawberry plants, some raspberry, currant, and gooseberry bushes, in a flourishing state, with a few small black alder trees. There are likewise a species of fow-thistle, goose-grass, some crow's foot, with a fine crimson flower, and two sorts of anthericum, one with a large orange flower, and another with a blue one. In the same situations were found some wild rose-bushes just budding, young leeks with triangular leaves, a small sort of grass, water-creffes, and andromeda in great abundance. Within the woods were mosses and ferns of different sorts. As captain Cook and his companions lay in a cove on an island, they observed in the woods there only two or three racoons, martins, and squirrels; and the account they give us of the quadrupeds is taken merely from the skins, which were brought by the natives for sale; and these were often in a very mutilated state, and scarcely enabled them to determine to what animals they belonged. The most common were bears, deer, foxes, and wolves. The sea-animals seen off the coast were whales, porpoises, and seals. The sea-otter also abounds here: and the fur of this animal is softer and finer than that of any others; so that the discovery of this part of the continent of North America, where so valuable an article of commerce may be obtained, cannot be a matter of indifference. Birds are scarce both as to species and number: those which frequent the woods are crows and ravens, of the same kind with those in England, a blueish jay or magpie, common wrens, the Canadian or migrating thrush, and a considerable number of brown eagles, with white heads and tails. Amongst those which were distinguishable by their dried skins, or certain fragments, were a small species of hawk, a heron, and the large crested American king-fisher. Here also are different species of wood-peckers, some small birds of the finch kind, the sand-piper, and humming-birds. Off the coast were seen the quebrantahueffos, gulls, and shags, wild-ducks, swans, and plovers. Fish are more plentiful than birds, though the variety is not great: the principal sorts are the common herring and sardine, which come in large shoals, and at stated seasons. Breems, both the silver-coloured and gold-brown coloured, are next to the former in quantity. There are other fishes, which are scarce. Sharks sometimes frequent the found. The other marine animals are a small cruciated medusa or blubber, star-fish, small crabs, and the cuttle-fish. About the rocks are large muscles, sea-ears, and shells of large chamæ; and the smaller sorts are trochi, murex, rugged wilks, and snails. Besides these, there are some small cockles and limpets. In the found, or upon the coast, there is red coral, as it was found in the canoes of the natives. The only animals of the reptile kind observed here, and found in the woods, were brown snakes, with whitish stripes on the back and sides, which are harmless; and brownish water-lizards. The insect tribe forms a numerous class; but of minerals, no ores of any metal were seen, if we except a coarse, red, earthy or ochry substance, used by the natives in painting themselves, which may probably contain a little iron; with a white and blueish pigment, used for the same purpose. Besides the stone or rock that constitutes the mountains and shores, which sometimes contains pieces of very coarse quartz, here were found a hard black granite, a greyish whet-stone, the common oil

stone of our carpenters. The natives also use the transparent leafy glimmer, or Muscovy glass, and rock-crystal.

The persons of the natives are, in general, under the common stature, but not slender in proportion; being commonly pretty full or plump, though not muscular. The visage of most of them is round and full, and sometimes also broad, with high prominent cheeks; and, above these, the face is frequently much depressed, or falling in between the temples; the nose is flat at its base, the nostrils are wide, and its point is rounded; the forehead low, the eyes small, black, and rather languishing than sparkling; the mouth round, with large round thickish lips; the teeth tolerably equal and well set, but not remarkably white. They have either no beards at all, which is most commonly the case, or a small thin one upon the point of the chin, which is owing not to a natural defect of hair, but to its being plucked out; some, and particularly the old men, have not only considerable beards all over the chin, but whiskers or mustachios. Hence we may conclude, that the remarks of M. de Paw, Dr. Robertson, and other writers, exemplified in the defect of beards among the American Indians, are unfounded. The eye-brows are scanty and narrow; but the hair of the head is abundant, and also very coarse and strong; and, without a single exception, black, straight, and lank, or hanging down over the shoulders; the neck is short, the arms and body clumsy; and the limbs small, in proportion to the other parts, as well as crooked, or ill-made, with large feet badly shaped, and projecting ankles. It is not easy to distinguish their true colour, as their bodies are incrustated with paint and dirt; but where it could be perceived, the whiteness of the skin appeared almost to equal that of the Europeans, especially those in southern latitudes. The whole body of the people seems to be characterized by countenances, exhibiting a dull phlegmatic want of expression. The women resemble the men in size, form and colour, nor are the sexes easily distinguishable; of the females, none even of those who are in the prime of life, have the least pretension to be called handsome. Their common dress is a flaxen garment, or mantle, ornamented on the upper edge by a narrow strip of fur, and at the lower edge, by fringes or tassels; this passes under the left arm, and is tied over the right shoulder by a string before and another behind, near its middle. Over this, which reaches below the knees, is worn a small cloak of the same substance, likewise fringed at the lower part. The head is covered with a cap, of the figure of a truncated cone, or like a flower-pot, made of fine matting, having the top frequently ornamented with a round or pointed knob, or bunch of leathern tassels, and fastened under the chin. Besides this dress, which is common to both sexes, the men frequently throw over their other garments the skin of a bear, wolf, or sea-otter, with the hair outward; in rainy weather they throw a coarse mat about their shoulders; and they have also woollen garments which are little used. As they rub their bodies constantly over with a red paint, made of a clayey or coarse ochry substance, mixed with oil, their garments contract a rancid offensive smell, and a greasy nastiness. These garments, and also their heads, swarm with vermin, which they pick off with great composure, and eat. Although their bodies are always covered with paint, their faces are often stained with a black, a brighter red, or a white colour, by way of ornament; and this gives them a ghastly disgusting aspect. They also strew the brown martial mica upon the paint, which makes it glitter. The ears of many of them are perforated in the lobe with a large hole, and with two others higher up on the outer edge; and in these holes they hang bits of bone, quills fixed on a leathern string, small shells; bunches of woollen tassels, or

pieces of thin copper. The septum of the nose is also sometimes perforated, through which they draw a piece of soft cord; and others wear, in the same place, small thin pieces of iron, brass, or copper, shaped almost like a horse-shoe, the narrow opening of which receives the septum, so as that the two points may gently pinch it; and the ornament thus hangs over the upper lip. About their wrists they wear bracelets or branches of white bugle beads, made of a conic shelly substance, bunches of thongs, with tassels, or a broad black shining horny substance of one piece. About their ankles they also wear many folds of leathern thongs, or the sinews of animals twisted to a considerable thickness. On extraordinary occasions, when they exhibit themselves as strangers, in visits of ceremony, and when they go to war, they wear the skins of animals, as of bears and wolves, curiously ornamented; and on the head a quantity of withe, or half-beaten bark wrapped about it, with large feathers, particularly those of eagles, interspersed with small white feathers. The face is also variously painted, with different colours and gashes, or besmeared with a kind of tallow, mixed with paint, formed into various figures, and appearing like carved work. Their hair is also separated into small parcels, and tied at intervals of about two inches to the end with thread; and others tie it together. Thus dressed, they exhibit a savage and incongruous appearance, which is much heightened by monstrous decorations, consisting of a variety of carved wooden masks or vizors, applied to the face, the head, or forehead. These grotesque appearances resemble either human faces, the heads of birds, or those of land and sea animals. It is not certain what views they have in assuming these extravagant masquerade ornaments; possibly they may adopt them on particular religious occasion or for diversion; or for intimidating their enemies, or as decoys to animals in the chase. The only dress among the people of Nootka, peculiarly adapted to war, is a thick leathern mantle doubled, which seems to be the skin of an elk, or buffalo tanned. This forms a kind of coat of mail, or complete defensive armour. They also wear a kind of leathern cloak, covered with rows of dried hoofs of deer, disposed horizontally, appended by leathern thongs and covered with quills; which, when they move, makes a kind of rattling noise, almost equal to that of many small bells. These people, thus formidable in their appearance when they assume their military garb, have not the least appearance of ferocity in their countenances, when divested of it; but seem to be, in a considerable degree, destitute of that animation and vivacity, which would render them agreeable as social beings. Such is their disposition that, even in the greatest paroxysms of their rage, they seem unable to express it sufficiently, either with warmth of language, or significance of gestures.

Although there is too much reason, from their bringing to sale human skulls and bones, to infer that they treat their enemies with a degree of brutal cruelty, this circumstance seems to be only an indication of general agreement of character with that of almost every tribe of uncivilized men, and furnishes no just occasion for reproaching them with peculiar inhumanity. They appear to be a docile, virtuous, good-natured people; but notwithstanding the phlegm of their temper, quick to resent injury, and as prompt to forgive it. Their other passions, and particularly their curiosity, seem to lie dormant. Nevertheless they are not wholly unsusceptible of the tender passions. In proof of this it is alleged that they are fond of music, which is mostly of the grave or serious, but truly pathetic sort. In their songs they keep the exactest concert; and they sing in numbers together. These are generally slow and solemn, with numerous and expressive variations, and a cadence or melody powerful

fully soothing. Besides their full concerts, sonnets of the same grave cast are frequently sung by single performers, who keep time by striking the hand against the thigh. The music, however, is sometimes varied from its predominant solemnity of air; and stanzas are sung in a more gay and lively strain, and even with a degree of humour. The only instruments of music which were observed among them were a rattle, and a small whistle, about an inch long, incapable of any variation, from having but one hole. The rattles are, for the most part, made in the shape of a bird, with a few pebbles in the belly; and the tail is the handle.

In traffic, some of them betray a knavish disposition, and carry off goods without making any return. But in general, says Capt. Cook, we had abundant reason to commend the fairness of their conduct. Such, however, was their eagerness to possess iron and brass, and, indeed, any kind of metal, that few of them could resist the temptation to steal it, whenever an opportunity offered; nor did they pilfer any but that which they could convert to useful purposes, and had a real value in their estimation; so that they were thieves in the strictest sense of the word. Amongst themselves, stealing is a very common practice, and is the occasion of many of their quarrels.

In the two towns, or villages, which seemed to be the only inhabited parts of the Sound, the number of occupiers amounted to about 2000. The houses are disposed in ranges, rising one above the other; the largest being in front and the others of smaller size. These ranges are interrupted or disjointed at irregular distances, and they are separated by wider intervals. They are built of very long and broad planks, resting upon the edges of each other, and fastened by withes of pine bark. Their height at the sides and ends is seven or eight feet; but the back part is a little higher, so that the planks slant forward, and thus are kept loose that they may be put close to exclude rain, or separated for letting in light and discharging the smoke. Upon the whole, however, they are wretched hovels, constructed with little or no ingenuity. Their furniture consists chiefly of a great number of chests or boxes, piled upon each other; and containing their spare garments, skins, masks, and other things which they chiefly value. Their other domestic utensils are mostly square and oblong pails or buckets, to hold water and other things, round wooden cups and bowls, and small shallow wooden troughs, about two feet long, out of which they eat their food; and baskets of twigs, bags of matting, &c. Their fishing implements and other articles are laid, without order, in other parts of the house: their sleeping benches have nothing but the mats. The nastiness and stench of their houses is equal to the confusion. They rather resemble hog-sties than human habitations; every thing within and without stinking of fish, train-oil, and smoke. Many of their houses, notwithstanding their disorder and filth, are decorated with images, formed of trunks of large trees, four or five feet high, set up singly or by pairs at the upper end of the apartment, with the front carved into a human face, the arms and hands cut out upon the sides, and variously painted; so that they are truly monstrous figures. The general name of these images is "Klumma," and in one of the houses were two others, denominated "Natakkoa," and "Matseeta." A mat is generally hung before each of these images, which the natives are not willing to remove; and when they unveiled them, they spoke of them in a very mysterious manner. It is their custom to make offerings to these images, and they expect others to do the same. Hence it may be inferred, that they are representatives of their gods, or symbols of some religious or superstitious object; but Cook

says, they were held in slight estimation, as for a small quantity of iron or brass, he could have purchased all the gods (if the images were such) in the place.

The chief employment of the men seems to be that of fishing, and killing land or sea animals for the sustenance of their families; and the women occupy themselves in manufacturing their woollen or flaxen garments, or in preparing the fardines for drying. The women also go in small canoes to gather muscles and other shell-fish. The young men seemed to be the most indolent in this community; for they lay about, basking themselves in the sun, or wallowing in the sand, like a number of hogs, without any covering. But this disregard of decency was confined to the men: the women were always clothed, and behaved with the utmost propriety. These people spend much time in their canoes in the summer season; eating and sleeping in them, especially in those of the largest sort, which are much more comfortable habitations than their houses. Their chief food consists of fish, muscles, smaller shell-fish, and sea animals. Their most common vegetables are two sorts of liliaceous root, which have a mild sweetish taste, are mucilaginous, and are eaten raw. Another root resembles our liquorice, and another a fern-root. They have also other roots, which they eat raw. It is their common practice to roast or broil their food, for they seem to be unacquainted with our method of boiling. They are as filthy in their mode of eating as they are in their persons and their houses. The troughs and platters in which they put their food do not seem to have been washed since they were first made. Every thing solid is torn to pieces with their teeth; and having no idea of cleanliness, they eat the roots which they dig from the ground, without shaking off the soil that adheres to them.

Their weapons are bows and arrows, slings, spears, short truncheons of bone, and a small pick-axe, like the American tomahawk: which is a stone, six or eight inches long, pointed at one end, and by the other fastened into a handle of wood. The handle resembles the head and neck of the human figure, and the stone is fixed in the mouth, so as to represent an enormously large tongue: and to make the resemblance stronger, they affix human hairs to it. That their wars are frequent and bloody is evident, from the number of human skulls which they offered for sale. Their manufactures and mechanic arts are more extensive and ingenious, both as to design and execution, than might have been expected among a people in so bad a state of civilization, and of so indolent a temper. Their flaxen garments are made of the bark of a pine-tree, beaten into a hempen state. Their woollen garments have the strongest resemblance to woven cloth, though they are unacquainted with the use of the loom. The wool is taken from different animals, as the fox and brown lynx. The ornamental figures in these different garments are disposed with great taste, and dyed of different colours. Their fondness for carving is manifested in every thing that is made of wood. Small whole human figures, representations of birds, fish, land and sea-animals, models of their household utensils and of their canoes, are found among them in great abundance. They also practise drawing for various purposes. The whole process of their whale-fishery is painted on the caps they wear. Their rude performances in this way serve to shew, that though there be no appearance of the knowledge of letters amongst them, they have some notion of commemorating and representing actions in a permanent manner, independently of what may be recorded in their songs and traditions. Their canoes are of a simple structure, but well adapted to every useful purpose. The largest, which carry twenty people or more, are formed of one tree. Many

are forty feet long, seven broad, and about three deep. From the middle, towards each end, they become gradually narrower, the after-part, or stern, ending abruptly or perpendicularly, with a small knob on the top; but the fore-part is lengthened out, stretching forward and upward, ending in a notched point or prow, considerably higher than the sides of the canoe, which run nearly in a straight line. They are mostly without ornament; nor have they any seats, or supporters, on the inside, besides several round sticks, somewhat thicker than a cane, placed across at mid-depth. They are very light, and by means of their breadth and flatness they swim firmly, without an outrigger, which none of them have, in which respect they differ from those of other countries. Their paddles are small and light, and in managing them they are very dextrous. Their implements for fishing and hunting, which are ingeniously contrived and well made, are nets, hooks and lines, harpoons, gigs, and an instrument like an oar; which last is about twenty feet long, four or five inches broad, and about half an inch thick. Each edge, for about two-thirds of its length, the other part being a handle, is set with sharp bone-teeth, about two inches long. Herrings and sardines, and such other small fish as come in shoals, are attacked with this instrument, which is struck into the shoal, and the fish are caught either upon or between the teeth. Their hooks are made of bone and wood; and the harpoon, which is excellently contrived, is composed of a piece of bone, cut into two barbs, in which is fixed the oval blade of a large muscle shell, in which is the point of the instrument. To this is fastened a rope of about two or three fathoms; and for throwing this harpoon they use a shaft of about twelve or fifteen feet long, to which the line or rope is attached, and to one end of it the harpoon is fixed, so as to separate from the shaft, and leave it floating upon the water as a buoy, when the animal darts away with the harpoon. In killing land animals of the smaller sort they use arrows, and engage bears, wolves, and foxes with their spears. In decoying animals they cover themselves with a skin, and run nimbly about upon all fours, making at the same time a kind of noise or neighing; and on these occasions, they put on the masks, or carved heads, as well as the real dried heads, of the different animals. Their ropes are made either from thongs of skins and sinews of animals, or of the flaxen substance, which is the material of their mantles. The chisel and the knife are the only instruments of iron which they use. Their iron tools are sharpened upon a whetstone, and always kept bright. The most probable method by which they get their iron is by trading for it with other Indian tribes, who either have immediate communication with European settlements upon that continent, or receive it, perhaps, through several intermediate nations.

Of the political and religious institutions established among these people, we have little information. They have among them such men as chiefs, to whom others of their respective families appear to be subordinate. Besides the figures already mentioned, and called "Klumma," they have no other indications of religion. These are most probably idols; and are the images of some of their ancestors, whom they venerate as divinities. But they seemed to receive from the people no act of religious homage.

Their language is by no means harsh or disagreeable, any farther than their using the *k* and *h* with more force than we do; and upon the whole, it abounds rather with labial and dental than with guttural sounds. The simple sounds, that are either wholly wanting or

rarely used, are those represented by the letters *b, d, f, g, r, and v*. But they have one common sound, which is formed by clashing the tongue partly against the roof of the mouth with considerable force, and may be compared to a very coarse or harsh method of lisping; it may be represented by such a composition of letters as *l f z t d l*. This is one of the most usual terminations of their words. In their language there seem to be few prepositions or conjunctions, and it is altogether destitute of an interjection, to express admiration or surprize. Each single sound comprehends several simple ideas; and the language appears not to be sufficiently copious.

The latitude of the observatory erected by our navigators was $49^{\circ} 36' 6'' 47'''$ north; and the longitude by lunar observations $233^{\circ} 17' 14'' 0'''$ east, and by the time-keeper $235^{\circ} 46' 51'' 0'''$ according to the Greenwich rate, but according to the Ulietea rate $233^{\circ} 59' 24'' 0'''$. The variation of the compass at the observatory was $15^{\circ} 49' 25''$ east, and on board the ship $19^{\circ} 44' 37\frac{1}{2}''$. The mean inclination of the dipping-needle, on shore, was $72^{\circ} 32' 34\frac{1}{4}''$, and on board $72^{\circ} 25' 41\frac{1}{4}''$. On the days of new and full moon it was high water at 12 20": and the perpendicular rise and fall of the day-tide was eight feet nine inches, and the night-tides at the same time, *i. e.* two or three days after the full and new moon, rose near two feet higher. (Cook's Third Voyage, vol. ii.) In 1786, a settlement was established at Nootka found by a company of British merchants residing in the East Indies, under the appellation of the "King George's Sound Company," for carrying on a fur-trade from the western coast of America to China; but the settlement was seized by the Spaniards in 1789. For a further account of the fur-trade at Nootka found, &c. see *FUR-trade*.

NOOVILLA, a town of East Florida; 54 miles E.S.E. of St. Mark.

NOOZE, or NOOSE, a name given by sportsmen to a sort of horse-hair springe made to take woodcocks, and very successful when the proper precautions are taken. The nooze is made of several long and strong hairs twisted together, with a running nooze at one end, and a large knot at the other, which is to be passed through the slit of a cleft stick, to prevent the nooze from being pulled away when the bird is caught in it.

The sportsman, when he knows his business, does not stay to watch these snares, but sets them in the morning, and returns again to them at four in the afternoon, when he seldom fails of meeting with a sufficient number taken. The sticks are to be about the bigness of a man's little finger, and are to be made sharp at one end, that they may fix the better in the ground: to each of these is to be fixed one nooze. The sportsman is to take out with him several dozens of these bundled up together, and going into the coppice woods, where there lie many leaves upon the ground, he is to search among these for the marks of woodcocks frequenting the place; if there come any there, it will soon be found out by the leaves, which are spread about from side to side by those birds, in searching under them for worms. Their dung also, which is of a dark grey colour, being found about the place, is a proof of their frequenting it.

When the place is thus pitched upon, the sportsman is to take a large circle at some distance from it, on each side, in the way where the woodcocks are supposed to come to the place; he is here to plant a small hedge-row of furze, or other bushes, of a considerable extent, and pretty thick, leaving gaps in it here and there. The woodcocks, in making up to their place of feeding, when they come to this hedge, will run along by the side of it, till they come to one of the gaps,

gaps, and then go through, for they hate to take wing, and will run, at any time, a long way under a hedge, rather than fly over it. On this depends the success of the sport.

The noozes are to be fixed one in each of these gaps through which it is known the woodcocks will pass; the stick to which it is fastened is to be stuck firmly in the ground, and the nooze to be spread wide open on the ground, leaving only some dry leaves to support it. The whole gap being occupied by this nooze, the woodcock, when he comes, cannot easily escape, being taken by the legs in it, and when once caught he will lie till the sportsman comes. While a sportsman is walking about a wood in this view, it is very common for him to find springes, or noozes of horse-hair, fixed at six inches high, in several places. This may be looked on as a proof that there are partridges in the wood, and these are the means used by the country people to take them. The woodcocks, though in the day they lie in woods, yet, in the night, they go out, and frequent rivers and brooks, and, in the frosty nights, such springes as do not freeze are particularly resorted to by them.

The sportsman, when he has set his noozes in the woods for the day time, should retire to the watery places near them, and search for the marks of these birds coming to them by their dung and other tokens. As soon as a place is found which they frequent, there must be a small hedge-row built there also, in the same manner as in the woods; and in the gaps, which are to be made at the distance of about six feet one from another, there are to be placed either the same sort of noozes as those in the woods, or the springes made with hazel-boughs, and the horse-hair tied to a pack-thread. In either case, there is no doubt of success, for the birds which have once frequented a place, will come to it every night, as long as they remain any where near it; but particularly if there be any spring near a wood, the water not freezing when other waters are iced over, will be sure to bring the woodcocks together at it, and noozes planted properly about this place will seldom fail of success. If they have been left a night or two without success, the sportsman is not to despair; for though there should happen to be no woodcocks there when they are first set, these birds change place so often, that it need not be doubted but so proper a rendezvous will be soon resorted to by them.

NOPELN, or CHRISTIANOPOL, in *Geography*, a town of Denmark, in the province of Blekingen; it is fortified, and almost surrounded by the Baltic; 23 miles N.E. of Carlscrona.

NOQUET'S BAY, a bay of Canada, on the N.W. coast of the lake Michigan; 45 miles long and 18 wide. N. lat. $45^{\circ} 25'$. W. long. $86^{\circ} 20'$.

NORA, a town of Sweden, in the province of Westmanland; 28 miles N.N.W. of Upsal.

NORADIN, in *Biography*, the son of Sanguin, or Emadeddin, sultan of Aleppo and Nineveh. When his father was slain by his eunuchs at the siege of Calgembur, in 1145, Noradin and his brother Seiffeddin divided the states between them. The former obtained the sovereignty of Aleppo, and by his prudence became one of the most potent princes in the East. He distinguished himself very greatly against the Christians in the time of the Crusades, and defeated Joscelyn, count of Edessa, and Raymond, prince of Antioch, after which he made himself master of Egypt. He died in 1174. He is characterised as a brave and generous prince, and many instances are related of his liberality.

NORAGUACHI, in *Geography*, a town of New Mexico, in the province of Cinaloa; 130 miles N.E. of Cinaloa.

NORAGUES, a river of Guiana, which runs into the Atlantic, N. lat. $4^{\circ} 50'$. W. long. $53^{\circ} 5'$.

NORAIE, LA, a town of Canada, on the river St. Laurence; 26 miles N.N.E. of Montreal.

NORAMPOUR, a town of Bengal; 15 miles S.E. of Calcutta.

NORANTEA, in *Botany*, a name of intolerable barbarism, perverted from the Guiana appellation of this tree, *Corono-antegri*, and justly rejected by Schreber.—Aubl. Guian. v. 1. 554. t. 220. Juss. 245. Lamarck Illustr. t. 447. (Asciun; Schreb. 358. Willd. Sp. Pl. v. 2. 1172.) See ASCIUM and MARGRAVIA.

NORBA, in *Ancient Geography*, a town of Italy, in Latium, at some distance to the left of the Appian way. Its ruins are still visible here, and consist of a wall about five or six miles in circuit, gates, towers, and other traces of buildings.

NORBA *Casarea* (Alcantara in Estramadura), a town of Spain, in Lusitania, situated towards the N.W., on the Tagus. Pliny calls it "Norbenfis Colonia," which proves that it was a Roman colony.

NOR-BARKE, in *Geography*, a town of Sweden, in Dalecarlia; 22 miles W.S.W. of Hedemora.

NORBOKITEN, a town of Prussia, in the province of Natangen, on the left bank of the Pregel; 48 miles E. of Königsberg.

NORBERG, a town of Sweden, in the province of Westmanland, in the vicinity of which are the best iron-mines of the province; 34 miles N. of Stroemsholm.

NORBERG, a town of Denmark, in the island of Assen. N. lat. $55^{\circ} 3'$. E. long. $9^{\circ} 46'$.

NORBERT, in *Biography*, a saint in the Roman calendar, and founder of the Premontre order of Augustine monks, descended from some of the most illustrious families of Germany, was born at Santen, a village belonging to the duchy of Cleves, in the year 1082. He was educated in the palace of Frederic, archbishop of Cologne, and was afterwards called to the court of the emperor Henry V., to whom he was related. Having made choice of the ecclesiastical life, he received deacons' and priests' orders in the same day, and was instantly raised to honour in the church. Afterwards the emperor created him his almoner, and offered him the bishopric of Cambrai, which he refused. He was distinguished by a pleasing person, agreeable manners, wit and humour, qualities that led him into company, by whose example he was insensibly corrupted, and in the end he disgraced his profession by giving himself up to irregularity and vice. At length his former good principles excited the compunctions of conscience, and he had fortitude to renounce his connections, and to set himself seriously to the business of reformation. He resigned his different church-preferments, sold his patrimonial estate, and distributed the proceeds among the poor. From this period he zealously devoted himself to the office of preaching, wandering about from city to city, and from country to country, for the purpose of combating heretics, and reforming the vicious and profligate. The bishop of Laon bestowed on him a sequestered dale, named *Premontre*, to which he retired in the year 1120, and there founded an institution of canons-regular, which took its title from the name of the secluded spot in which it was established. To this place he attracted vast crowds by the popularity of his sermons, and gained many disciples, who submitted to his code of discipline, formed on the regulations of St. Augustine, with the severe injunction of perpetual

perpetual silence, and permission to have only one frugal meal on each day. This order was confirmed in 1126 by pope Honorius II., and in a very short time Norbert succeeded in founding eight other monasteries, which adopted his discipline. In the year 1127 the people and clergy of Magdeburg prevailed upon him to accept of the archbishopric of their city. In 1131 he was present at the council of Rheims, which confirmed the election of pope Innocent II.; and he accompanied the emperor Lotharius to Rome, when he advanced with an army to expel from the seat of papal government Anacletus II., the rival of that pontiff. He died at Magdeburg in 1134, when he was only fifty-two years of age. He was placed in the catalogue of saints in the year 1584. The only part of his writings that has come down to our times is a short moral discourse, in the form of an exhortation to the monks of his order, which is inserted in the 21st volume of the *Bibl. Patrum*.

NORBERT, a Capuchin friar, famous for his adventures, and his hostility to the Jesuits, was the son of a weaver at Bar-le-duc, of the name of Parfot, where he was born in the year 1697. He embraced the monastic life, and after various employments, obtained, about the year 1734, the post of attorney-general of the foreign missions. In 1736 he went to Pondicherry, and was made a parish-priest of that city by M. Duplex, the governor. Here he quarrelled with the Jesuits, and removed from the East Indies to America. In different parts of this country he exercised the ministerial functions for a few years, and returned to Rome in 1744. He was now employed in drawing up an account of the religious rites of the Malabar Christians, and that he might not be interrupted by the intrigues of the Jesuits, he withdrew to Lucca, where he completed his work, under the title of "Historical Memoirs relative to the Missions into the Indies," in two vols. 4to. This work abounds in curious facts, and excited a great sensation at its first appearance, by discovering the means made use of by the missionaries of the society of Jesus, in order to increase their number of converts. This exasperated the Jesuits against him, and he was obliged to quit his country; he went first to Venice, then to Holland, and afterwards to England, where he established in the neighbourhood of London two manufactories of tapestry. From London he removed to Prussia, and from thence into the duchy of Brunswick. Here he was allowed by the pope to assume the habit of a secular priest. He now assumed the name of the abbé Platel, went to France, and from thence to Portugal, where, on account of the persecutions which he endured, he obtained a pension. Having completed his great work against the Jesuits, he revisited France, and committed it to the press, in six vols. 4to. Afterwards he re-entered the order of the Capuchins at Commercey, but being of a restless disposition, he soon quitted their community, and took up his abode at a village in Lorraine, where he died in 1770, at the age of seventy-three.

NORCIA, in *Geography*, a city of Italy, in the duchy of Spoleto, the see of a bishop, suffragan of the pope; governed by its own magistrates; 18 miles S.E. of Spoleto. N. lat. 42° 37'. E. long. 13° 4'.

NORDBERG, JORAN, in *Biography*, was born at Stockholm in the year 1677. Having completed his education at the university of Upsal, he entered into holy orders in 1703, and being appointed chaplain-extraordinary to the artillery, joined the Swedish army, then encamped before Thorn, and remained with it during the campaigns in Poland and Saxony till the year 1709. In the course of that period he formed an acquaintance with the most celebrated of the German literati, and was promoted to be first

chaplain to the royal life-guards, and chaplain to the court. After the battle of Pultowa he was taken prisoner by the Russians, but was permitted to remain in the same place with count Piper, the Swedish minister, also a captive, whom he accompanied in all the removals which he experienced during his long confinement. In 1715 he was exchanged, and returned to Stockholm; in the following year he repaired to his sovereign at Stralsund, and afterwards attended him to Scandinavia, and in his expedition to Norway. Towards the close of the year he was appointed to the living of St. Clara and St. Olaus, at Stockholm, and in 1731 was selected to compose a history of Charles XII., a task which he executed in a very ample manner, partly from facts derived from his own observation, and partly from information communicated to him by various persons who had accompanied the northern hero in his campaigns. This work, after frequent revisions, was published at Stockholm in the year 1740, in two volumes folio, and afterwards translated into the German and French languages. The author of it died in 1744. He was always held in great esteem by his sovereign, and after his death he enjoyed the favour of the queen Ulrica Eleonora, the king's sister. Besides his history, he published some funeral sermons, of which he wrote a great number.

NORDEN, FREDERIC LEWIS, a naval officer in the Danish service, was born at Gluckstadt, in Holstein, in the year 1708. He was skilled in mathematics, in ship-building, and all the branches of agriculture. In 1732 he obtained a pension to enable him to travel for the purpose of studying the construction of ships, particularly the galleys and other rowing-vessels used in the Mediterranean. He spent about three years in Italy, and Christian VI. being desirous of obtaining a circumstantial account of Egypt, Mr. Norden, while at Florence, received an order to extend his travels into that country. He published an account of his travels into Egypt and Nubia in the year 1756, which were translated into the English by Dr. Peter Templeman. In the war between England and Spain, Mr. Norden, then a captain in the Danish navy, attended count Ulric Adolphus, a sea-captain, to England; and they went out volunteers under sir John Norris, and afterwards under sir Chaloner Ogle. During his residence in London, Mr. Norden was made fellow of the Royal Society, and gave the public drawings of some ruins and colossal statues at Thebes in Egypt, with an account of the same in a letter to the Royal Society, in 1741; after this he undertook a tour into France, and died at Paris in 1742.

NORDEN, in *Geography*, a sea-port town of East Friesland, about three German miles from the sea, large and commercial, with a good harbour; 15 miles N. of Emden. N. lat. 53° 34'. E. long. 7° 10'.

NORDENBURG, a town of Prussia, in the province of Natangen, founded by the Teutonic knights in a lake in 1305; 45 miles S.E. of Königsberg. N. lat. 54° 16'. E. long. 21° 45'.

NORDERNAY, an island in the German ocean, near the coast of East Friesland, about four miles long, and two at its greatest breadth. N. lat. 53° 40'. E. long. 7° 8'.

NORD FIORD, a bay on the N. coast of Iceland, N. lat. 66°. W. long. 17° 46'.

NORDFOE, a lake of Norway, 32 miles in circumference; 50 miles W. of Chritiania.

NORDHALBEN, a town of Bavaria, in the bishopric of Bamberg; 36 miles N.E. of Bamberg. N. lat. 50° 23'. E. long. 11° 37'.

NORDHAUSEN, a city of Germany, situated on the Zorge, between the county of Hohenstein and the lordship of Klettenberg, and divided into Old and New; containing seven

seven Lutheran churches and an orphan-house. It carries on a good trade in corn to the Upper Harz, and distils great quantities of brandy; it has also manufactures of marble and alabaster, the materials of which are brought from Stollberg and Hohenstein. It was a free imperial city from its foundation. In 1802 it was given among the indemnities to the king of Prussia, and in 1807 it was annexed to Westphalia, 38 miles N. of Erfurt. N. lat. $51^{\circ} 28'$. E. long. $10^{\circ} 56'$.

NORDHEIM, a town of Westphalia, in the province of Calenberg, seated on the Ruhme, which, separating into two branches, runs into the Leine. It has one parish-church, a grammar-school, and some manufactories. Albert the Great raised it into a town in 1252; 10 miles N. of Gottingen. N. lat. $51^{\circ} 40'$. E. long. $9^{\circ} 57'$.—Also, a town of the duchy of Wurzburg; 7 miles N. of Bischoffsheim.

NORDINGEN, a town of Sweden, in Angermanland; 21 miles N.N.E. of Hernösand.

NORDKIÖPING, a town of Sweden, in the province of East Gothland, on the river Motåla, founded in 980. It is next in extent to Stockholm, a staple town, and formerly fortified; it contains five churches, and about 10,000 inhabitants; its trade is considerable, and it has a new and commodious quay. It has two copper-mills, a hammer-mill for brags, several paper-mills, fifty corn-mills, woollen manufactures, a salmon-fishery, &c.; 76 miles S.W. of Stockholm. N. lat. $50^{\circ} 36'$. E. long. $16^{\circ} 4'$.

NORDKIRCHEN, a town of Germany, in the bishopric of Munster; 6 miles N. of Werne.

NORDLAND, a province of Sweden, bounded on the N. by Lapland, on the E. by the gulf of Bothnia, on the S. by Proper Sweden, on the W. by Norway, lying between 60 and $67\frac{1}{2}^{\circ}$ N. lat. It is a rocky and mountainous province, diversified with forests, verdant vallies, lakes, and rivers. It abounds with timber and venison; but has only a small portion fit for tillage. This province has, besides timber, several rich mines, forges, hammer-mills, and other works for metal. Its lakes and rivers supply plenty of fish, and cattle in great number are bred in the country. It abounds with flocks of wild geese. Beyond Upland bees are scarce. Some scattered tracts of land are inhabited by Finlanders. It is divided into seven provinces, and is supposed to contain 95,000 square miles, and 150,000 inhabitants, including the natives of Lapland. The provinces are, Gastrickland, Helsingland, Medelpad, Jemtland, Harjedalia, Angermannia, and Westro-Bothnia.

NORD-LIBRE, (CONDÉ), a town of France, in the department of the North, and chief place of a canton, in the district of Douay. The place contains 5978, and the canton 13,621 inhabitants, on a territory of $87\frac{1}{2}$ kilometres, in 10 communes.

NORDLINGEN, a city of Bavaria, situated in a fertile country on the Eger, with abundant pasturage. Until the year 1802, it was free and imperial, when it was given, among other indemnities, to the elector of Bavaria. The burghers are almost wholly Lutherans, who have three churches; but the Roman Catholics also have a place in which they celebrate their worship. The magistracy is composed of Lutherans. In 1796 it was taken by the French; 30 miles N.N.W. of Augsburg. N. lat. $48^{\circ} 49'$. E. long. $10^{\circ} 31'$.

NORDMALING, a sea-port town of Sweden, in the province of Angermanland, situated in a bay of the gulf of Bothnia. N. lat. $63^{\circ} 34'$. E. long. $19^{\circ} 24'$.

NORDMARSCH, a small island of Denmark, in the North sea; 3 miles N.W. of Nordstrand.

NORDORE, or **NORDTORP**, a town of the duchy of Holstein; 13 miles S.W. of Kiel.

NORDRE RÖNNERNE, a cluster of islets and rocks in the Cattegat, about four miles from the N.W. coast of the island of Læsø. N. lat. $57^{\circ} 22'$. E. long. $10^{\circ} 55'$.

NORDSTRAND, an island of Denmark, in the North sea, near the coast of Sleswick. The sea has often inundated it, and in 1634, the impetuosity of the waves swept away 6408 persons, 1332 houses, 30 wind-mills, 6 churches, and 50,000 head of cattle; and a great part of the island was destroyed. It formerly contained 22 parishes, and abounded in corn and cattle; but now only one parish remains. N. lat. $54^{\circ} 37'$. E. long. $8^{\circ} 48'$.

NORE, a river of Ireland, which rises at the southern part of the Slieve Bloom mountains, in the Queen's county, very near the rise of the Suire. After making a sweep to the eastward, it takes a S.S.E. direction through the Queen's county and that of Kilkenny, passing the city of Kilkenny and the towns of Thomestown and Inistioge, and joining the Barrow, which rises in the northern part of the same mountains, a little to the north of New Ross.—Also, a noted place in the river Thames, E. of the island of Grain, on which is a light fixed and a floating vessel. N. lat. $57^{\circ} 27'$. E. long. $0^{\circ} 44'$.

NORE, *Black*, a cape of England, on the coast of Somersetshire, in the mouth of the Severn; 5 miles S.W. from the mouth of the Avon.

NOREGNA, a town of Spain, in Asturias; 8 miles N.N.E. of Oviedo.

NORENBERG, a town of Germany, in the New Mark of Brandenburg; 21 miles E.N.E. of Stargard. N. lat. $53^{\circ} 27'$. E. long. $15^{\circ} 33'$.

NORES, JASON DE, in *Biography*, a man of letters of the 16th century, was born at Nicolia, in the isle of Cyprus. In his youth he studied at Padua, where he graduated. On his return to Cyprus, hearing of the death of his friend, Trifon Gabrielli, a learned man, whose house he had frequented at Padua, he put into Latin the Commentaries on Horace's Art of Poetry, which he had taken from the mouth of Trifon, and published them at Venice, with the addition of a brief compendium of Cicero's De Oratore. When Cyprus fell into the hands of the Turks in 1570, De Nores retired to Venice, with the loss of all his property, and lived there some years, probably supported by the liberality of some of the nobles. In 1577 he was appointed by those of his own nation to plead in their behalf before the doge, and not only obtained for them a settlement in the city of Pola, with many privileges, but procured for himself an appointment to the chair of moral philosophy at Padua. In this situation he wrote the greater part of his works, and continued to exercise his professional charge till his death, in the year 1590. The subjects of his several works are philosophical, cosmographical, political, and rhetorical. They display much learning, and are written in a good style. Moreri.

NORFOLK, in *Geography*, a county of England, situated on the eastern side of the island, and surrounded by the following counties and waters, viz. the German ocean, or North sea, on the north and east, Suffolk on the south, and the county of Cambridge on the west. The area thus enclosed is nearly of a circular form, and displays almost a flat surface: i. e. it has no prominent hills nor deep vallies. It is so surrounded by its marine and river boundary, that it may be considered almost an island, being connected with the adjacent land to the south solely by a narrow causeway, raised through the marshes, near Lopham. The longest diameter is in the direction of east to west, from Yarmouth to Wifbeach

beach; and the conjugate diameter, north and south, from Wells to Billingsford. Templeman estimates the former to be fifty-seven miles, and the latter thirty-five. He also states the contents to be 1426 square geographical miles; but Mr. Kent, whose skill and accuracy in surveying appears preferable, states, in his "General View of the Agriculture of Norfolk," the greatest length to be fifty-nine miles, and the greatest breadth to be thirty-eight, comprising an area of 1710 square miles, and 1,094,400 statute acres. Mr. Young, not being satisfied with this statement, had the latest survey of the county carefully measured; the result of which measurement gives 1830 square miles for superficies, and this countenances Mr. Howlett's opinion, that Norfolk is larger than Essex, which is estimated to contain 1,240,000 statute acres.

Norfolk is divided into thirty-three hundreds, containing one city, four sea-ports, twenty-five other market-towns, and seven hundred and fifty-six parishes; a greater number than any other county in the kingdom.

Climate, &c.—From the situation of the county, parts of it being exposed to the ocean, and others to a large extent of marsh-land, the air is extremely cold in winter, and at the early part of spring. North and north-easterly winds, it has been observed, are more prevalent here than in any other part of the kingdom. These are severely felt, and vegetation is consequently backward. The contiguity to the sea and the marshes, with the vapours brought from Holland, accounts for the frequent rains during the summer months; at which season, storms of thunder, lightning, and tornadoes, are not unusual, though they are seldom of so long duration as in more hilly districts. Mr. Young considers the temperature as rather affecting animal than vegetable life; but there does not appear any just ground for the distinction. The vital principle, whatever it may be, is evidently homogeneous throughout nature; and whatever operates upon that will produce salutiferous or deleterious effects upon vegetables as well as animals, though different in degree, and unequal in importance. Whoever has visited this county in the spring, and has previously examined the operations of nature in the midland districts, will be surprised at the backward appearance of the crops, and at the sight of nature dwindling under the apparent influence of even a genial sun. In the hundred of Marshland, and other fenny parts of the county, the air is not only cold, but exceedingly damp; and the inhabitants are subject to intermitting fevers. These are endemial, so that strangers, on their first residence, are generally attacked with agues; on which occasion they are proverbially said to be "arrested by the bailiff of Marshland." The county to the north and north-west of Thetford, forming the greater part of Norfolk, consisting of a sandy or gravelly soil, is peculiarly salubrious and pleasant.

Surface, general Appearance, and Soil of the County.—The face of Norfolk may be considered as less varied in its features than that of any tract of country of equal extent in the kingdom. In the northern parts, the general surface is somewhat broken into moderate elevations and depressions; where turf-clad hills and fertile vallies are diversified by woods, coppices, hedge-rows, and other enlivening sylvan decorations. The cottages and small farm-houses are many of them of wattle and dab, or lath and plaster, and covered with thatch; there are some, however, neatly built of brick, and roofed with slate or pantile. Numerous good houses of opulent yeomen, and the seats of the nobility and gentry, adorn many parts of the county. The surface, Mr. Kent observes, except about Norwich, and on the coast near Sherringham and Cromer, is chiefly a dead flat, the aspect

uniform; and, as the most interesting parts lie to the south-west, where strangers generally enter the county, it must offer to them a dreary and forbidding appearance. The entrance from the south, by way of Colchester, however, brings the traveller into a fine rich country, towards the north and north-east; and these parts being enclosed, well cultivated, and abounding with timber, more than most maritime districts, exhibit a variety of cheerful scenes and pleasing views. "As to the soil," observes Fuller, "here are fens and heaths, light and deep sand and clay-grounds, meadow-lands, and pastures and arable, wood-lands, and woodless." Mr. Kent divides the county into five parts as to soil. First, the district to the north and north-east of Norwich, comprising the hundreds of East and West Flegg, South Walsham, Blofield, Wapping, Tunstead, and the greatest part of North and South Erpingham, which consists of a sandy loam, "equal in value to the best part of the Austrian Netherlands, to which it is similar." Second, the district to the south and south-east of Norwich, including the hundreds of Loddon, Clavering, Henstead, Earsham, Difs, Deepwade, and Humbleyard, and some parts of Forehoe and Mitford, consists of stiff wet land, composed of a mixture of sand and clay, and abounds with springs. Third, the district containing the largest part of the county, and lying to the west and north-west of Norwich, comprises the hundreds of Taverham, Eynsford, Holt, North Greenhoe, Gallow, Launditch, Brothercrofs, Smithdon, Freebridge, and Clackclose. This is what generally goes by the name of West Norfolk, and consists principally of light sandy land, and "is a very inferior country to the two preceding districts." The fourth district, lying south-west of Norwich, comprises the hundreds of Shropham, Guitcrofs, Weyland, South Greenhoe, and Grimshoe, consists of a light sand; so light, indeed, in the latter hundred, that it frequently drifts in the wind, and is bare of vegetation. Marshland may be considered a fifth district by itself, consisting of ooze formed by deposition from the sea. To this may be added a narrow tract of similar land on the eastern part of the coast near the mouth of the rivers Yare and Waveney. This extends a considerable distance up the county towards Norwich; the whole of which, in winter, is generally under water, and in the spring it is expedient to drain it for the purposes of depasturing. There are also large tracts of swampy ground in the vicinity of Lodham, frequently inundated by land floods, and producing little but sedge and reeds. In the south-west part of the county is an extensive tract of land, which cannot class with either of Mr. Kent's divisions, being essentially different from them all. It forms part of that immense fenny district, which extends out of this county into those of Cambridge, Northampton, and Huntingdon, also into Suffolk and Lincolnshire.

The soils of this county are described by Arthur Young in the following table, which specifies the number of square miles and acres occupied by each.

	Square Miles.				Acres.	
Light sand	-	-	220	-	-	140,800
Good sand	-	-	420	-	-	268,800
Marshland clay	-	-	60	-	-	38,400
Various loams	-	-	900	-	-	576,000
Rich loam	-	-	148	-	-	94,720
Peat	-	-	82	-	-	52,480

Woods and Plantations.—Norfolk, by some writers, has been described as a well wooded county; and by others as almost wholly destitute of that interesting vesture: both opinions have proceeded from a superficial or partial view of the district. In some parts the hedge-rows abound with

numerous trees, which, at a distance, by aggregation, give an idea of extensive woods; and in others the great expanse of heath and unclothed lands, stripped of every timber tree, exhibit a dreariness which, unrelieved by sylvan scenery, tends to impress the mind with the idea that Vertumnus, as well as Pomona, have neglected or refused to take this district under their protection. There are, however, numerous woods, but they are partially scattered through the county. The principal are those of Foxley, in the hundred of Eynsford; some to the westward of Wymondham, in Forehoe; Shottesham, in Henstead; Ashwellthorpe, Hampnell, and Bunwell, in Deepwade; Hethel, Hetherfel, and Hetteringham, in Humbleyard. A laudable spirit has prevailed of late among the proprietors of large estates to plant, not merely for embellishment, but for use. Extensive plantations of timber trees have been made in many parts, but more particularly in the north-western.

Coasts, Rivers, Canals, Roads, &c.—The coast of Norfolk varies considerably in its outline and substance from the south and western shores of the island. No deep indented bays, nor sinuous creeks intersect the land, nor beetling rocks and bold impending crags here form an adamantine barrier to the assailing waves: and though a continuation of that great bed of chalk, which, commencing in the high cliffs of Dorsetshire, passes through the kingdom, and terminates here, yet it forms on this part of the coast no proud elevations nor conspicuous heights. The shores are generally flat. In the vicinity of Cromer is a small bay, where some bold headlands present themselves: and some wooded hills make a little variety in the neighbourhood of Sherringham. Exclusive of these, which are on a small scale, Hunstanton-cliff, commonly denominated St. Edmund's Point, from king Edmund having landed there when he took possession of East Anglia, may be considered as the only rocky prominence of much note on the coast. The other eminences consist of clay, and are constantly becoming a prey to the depredations of the ocean. Much of the coast is comprised of a low sandy beach, covered with gravel and loose pebbles, here called shingles; which, by the violence of the waves, are frequently thrown up in immense heaps. These, by the continual accumulations of sand, are formed into banks, which are kept together by the matted roots of what is called *sea-reed grass*. Numerous banks of this kind lie off the coast far out at sea; and being only discoverable at ebb or quarter tides, they are justly the dread of mariners, and frequently prove fatal to coasting vessels. Of these, the most remarkable is the large bank running parallel with the coast off Yarmouth, between which and the shore is a deep channel, where vessels ride safely during tempestuous weather. This is known by the name of Yarmouth Roads.

The ranges of sand-hills on this, like those on the opposite coasts of Holland, tend to preserve a valuable portion of country from continual inundation. A line of these, called the Meals, or Marum Hills, commences at Caister, two miles north of Yarmouth, and extends, with occasional interruptions, to Happisbury Point, where two light-houses have lately been erected, and thence to Cromer Bay, where what are called the Mud Cliffs begin, and line the northern shore to Lynn Regis. These sand-banks are not all permanent; they sometimes shift their station by a sub-marine route. Suddenly they disappear, and as suddenly rise up in a new shape at some distant point, a curious instance of which happened on the coast near Yarmouth about two centuries ago; which will be noticed in a subsequent account of Yarmouth.

The principal rivers of Norfolk are the Great Ouse, the Little Ouse, the Waveney, the Bure, the Wenfum, the Yare,

and the Nar. The Great Ouse, or Ouze, rises near Brackley, in Northamptonshire, and having been previously joined by the Lark, the Cam, and the Little Ouse, enters this county to the south-west of Downham; passes under Stow, Magdalen and German bridges, and then, joined by the Nar from the eastward, empties its waters, after a course of nearly sixty miles, into the bay called by Ptolemy Metaris-Æstuarium, two miles below the harbour of Lynn Regis; where the trade of that port exhibits a crowd of vessels on its estuary, called Lynn-Deeps. The tide flowed up this river many miles further formerly; it now being checked by sluices, erected near Denver for the purposes of drainage and navigation. This river "is remarkable for its extraordinary swell or overflowings at the two equinoxes, and especially at the full moon of the autumnal one; when a vast heap of waters from the sea comes in upon it, with every thing in its way, and the very water-fowl shun it." It is navigable twenty-four miles above Lynn for barges through this county, and for small boats as far as Bedford; thus forming a communication by means of other collateral rivers and canals with seven of the midland counties.

The Little Ouse, or, as in some deeds it is denominated, Brandon river, rises in a swampy meadow near the village of Lopham, in the southern part of this county; and, taking its course westerly by Rushford, receives a small stream from Ixworth. It is joined by the Thet at Thetford, whence, meandering through a sandy soil, it passes under Brandon bridge, and stealing along with solemn pace through the uninteresting level of the fens is then "wedded," as Drayton calls it, to the Greater Ouse at Littleport, on the borders of Cambridgeshire. The Little Ouse is navigable up to Thetford.

The Waveney also takes its rise at Lopham. It is somewhat singular, that though the Little Ouse and the Waveney have their sources in the same tract of swampy ground, and near each other, they immediately take opposite directions in their course to the sea; the one running due west, and the other almost directly east. The Waveney is navigable for barges from Yarmouth, to Bungay bridge in Suffolk.

The Bure rises near Heldolveston, on the north side of the county, and, taking its course by Blickling, becomes navigable at Aylesham. After receiving some tributary streams, and flowing under Wroxham bridge, it passes the site of St. Bennet's abbey, where it receives the Ant. A little further it is joined by the Thone, flowing from a lake near North Walsham; then passing under Acle bridge, and increased by the superfluous waters of the marshes, it joins the Yare, on the northern side of Yarmouth.

The Wenfum rises near West Rudham in this county, and being joined by numerous small rivulets in its progress, it passes the city of Norwich, part of which it environs. At Trowse it meets the Tas, or Tafe, and near Burgh is joined by the Waveney; about two miles west of Yarmouth it merges into the Yare.

The Yare is supposed to rise near Attleborough, and taking a north-easterly course joins the Wenfum to the east of Norwich.

The Nar, called also Seeky and Seecky river, has its source at Litcham, passes Castle-Acre to Narborough, thence flowing under Seeky bridge, falls into the Great Ouse near Lynn Regis. It is navigable from the latter as far as Narborough, an extent of about fifteen miles.

The Nene is no otherwise connected with Norfolk than serving to form part of the western boundary between this county and that of Lincoln.

Most of these rivers rise in marshy lands, and, running through a comparatively level country, the fall is consequently small, and their pace slow; so that they contribute to keep the adjacent grounds in a swampy state, and to fill the atmosphere with dense vapours. Swelled by land-floods above, and their mouths commonly choked by silt, thrown up by the violence of the tide below, they often overflow the low lands, and in their course form numerous, small, shallow lakes or pools, which are provincially termed *Broads* and *Meers*. These are plentifully stocked with fish, and much frequented by water-fowls. The principal of them are in that district through which the Bure, the Wensum, and the Waveney have their course. Brendon, or Breydon-Broad, to the south of Yarmouth, is three miles in length, and one mile and a half in breadth. Hickling-Broad is nearly three miles in length, and about one wide. That of Rockland is one mile and a half long, and half a mile wide. In the vicinity of these are several others of smaller extent, and of irregular dimensions. There are others at Quidenham, Difs, and Hingham. In the fenny districts many temporary ones are formed during the winter seasons, in the neighbourhood of which are numerous decoys for catching wild fowl.

Canals.—With respect to inland navigation, little more has yet been done in this county than widening and cleansing the beds of the natural rivers, and rendering them subservient to the purposes of internal conveyance. Much has been accomplished for a situation so circumstanced as Norfolk, and much more remains to exercise the ingenuity, and call forth the public spirit of the people. A canal has been completed from Wisbeach in Cambridgeshire, to Outwell creek, and Salter's Load in Norfolk, an extent of about six miles, to render the navigation of the river Nene more effectual. A few years ago a proposition was brought forward, and met with considerable support, for making the river Wensum navigable from Norwich to Fakenham; but the difficulties attending the plan, and the expences likely to be incurred in its execution, appeared to preponderate over the probable advantages to be derived from it by those parts of the country through which the line was proposed to extend. Had the scheme been carried into execution, it would have added, says Mr. Colhoun, more considerable advantage to the county of Norfolk than arises from any of the river navigations before enumerated. There are several small cuts from the navigable rivers to private estates for the purposes of carrying corn to the markets, and freighting back manure for the improvement of lands.

Roads.—From the nature of the various soils, the roads of Norfolk might be expected to be bad; but the reverse of this is generally the case. By a comparative statement, according to Mr. Kent, they "are better in their natural state in this than in almost any other county." At the time king Charles II. paid a visit to the earl of Yarmouth at Oxnead, in the year 1671, when roads had not been improved by the aid of tolls, he is said to have remarked, "that Norfolk ought to be cut out in strips to make roads for the rest of the kingdom." Except in the marshes and fens, the roads are free from sloughs and deep ruts; and though the superstratum is chiefly sand, yet it resists the pressure of carriage-wheels, a little beneath the surface: and the plentiful supply of gravel afforded in almost every part facilitates their repair at a moderate expence. Although this county claims the credit of having made the first road, in compliance with the Turnpike Act; yet, since that period, most other counties have surpassed it in such kind of improvements. The number of turnpike roads in the county is said to be seventeen, including an extent of about two hundred and

fifty miles. Besides these, there are many public ways, thirty and forty feet wide, which are equally commodious for travelling, without the interruption and expence of toll-bars; having mile-stones and finger-posts erected upon them for the direction of travellers. Some of these are kept in order by parochial rates, and others are repaired by private gentlemen.

Natural History, Productions, &c.—The natural history of this county has hitherto been much neglected or withheld from the public. Some researches have lately been made by a gentleman eminently qualified for such enquiries; the result of which, it is hoped, will shortly be presented to the world.

The native cow, a small animal, with short turned-up horns, "approaching to the Alderney," is generally of a red colour; not a good milcher, but hardy, and calculated for barren pastures. "Great part of this county is known to have been, within the space of a century, a wild, bleak, unproductive district; comparatively speaking, at least half of it was rabbit warrens and sweep-walks. The sheep were as natural to the soil as the rabbits, being hardy in their nature, and of an agile construction, so as to move over a great space with little labour." Among the farmers this breed of sheep is called *Norfolks*. It is a hardy horned animal, with a black nose, and feet of the same colour; carries a fleece of nearly two pounds; and, when fatted, weighs about eighteen pounds *per* quarter.

The pig of this district is comparatively a small, thin, bristled breed; very prolific, and the flesh esteemed savoury. The people of this county have an excellent mode of curing hams and cheeks; but the practice of feeding hogs for bacon is very seldom adopted here. The quantity of swine has been diminished by the decline of dairy farms, and the inclosure of the waste lands.

Poultry of all kinds are plentiful, and of a superior quality. Owing to the dryness of the soil, in the sandy and loamy districts, and the range afforded by the unclosed parts, turkeys are numerous; and the modes of feeding them produces a delicacy of flavour which has stamped a kind of imposing pre-eminence on every bird which bears the name of a Norfolk turkey. The consumption of these is very considerable, both in this and the adjacent counties; and yet such is the abundance, that immense quantities are sent to the most distant parts of the kingdom. It has been computed, that more turkeys are bred in this and the adjoining county of Suffolk, than in the whole kingdom besides. They are commonly driven on foot to London, and to other distant places. During one season, upwards of three hundred of these flocks, of some hundreds each, have been noticed to pass Stratford-bridge, on the river Stour, in their way to the metropolis; besides what proceeded by different routes to the same market.

Norfolk furnishes large supplies of geese, which are bred in the fenny parts of the county. The dealers have taught these awkward birds to travel on foot as well as turkeys; and prodigious numbers of them are sent annually to London from the neighbourhood of Downham, Wisbeach, and Lynn. The driving of these to market commences about the beginning of August, when the harvest being generally housed, the stubbles furnish provisions on the road, where they feed during the night. Turkey-polls, goslings, chickens, &c. used to be conveyed by light caravans; but now they are principally sent by the stage coaches. Of such animals as are *fera natura*, the rabbit claims the precedence; because it is made an object of trade to a considerable extent in this county. These profitable little animals are here extremely numerous; occasioned not only by their natural

fecundity, which is proverbial, but also by the congeniality of the soil with their peculiar habits. So prolific are they, that it is with difficulty, in some places, that they are kept from increasing to an alarming extent, as anciently they did, according to Pliny, in the Balearic isles: numbers breed about Castle-Rising, Thetford, Winterton, and Sherringham; but Methwold-heath is a celebrated place for the finest and best flavoured. This spot was noticed as a rabbit-warren so early as the reign of king Canute, A. D. 1016.

What is denominated *game* is very plentiful in this county. Hares, pheasants, and partridges are very abundant, and are protected with great jealousy and care by the noblemen and gentlemen of Norfolk. These are noted sportsmen, and where so much game prevails, there are also many poachers. Hence prosecutions on the Game Laws are very frequent in this county.

The meers and marshes of Norfolk are also much frequented by woodcocks, widgeon, teal, ducks, and other aquatic fowl. But among the curious birds, either residents or occasional visitors of Norfolk, that which most deserves notice, because now almost become a total stranger to the island, is the *otis tardi*, or great bustard. It is the largest of the British land-fowl; the male bird on an average weighing, according to Pennant, twenty-five pounds, and expands his wings nine feet in breadth; its length is about four. He usually inhabits the heath-lands and moors. They appear occasionally to the northward, in the wold of Yorkshire, and southward on Salisbury Plain, in Wiltshire, and on the downs of Dorsetshire. Some are found on the western side of this county. They are very shy birds, avoiding the haunts of men; and, though powerful on the wing, they seldom fly far without resting, and are never known to wander above twenty or thirty miles from the spot where they were first sledged.

The *Strix otus curtatus*, or short-eared, long-winged owl, is an occasional visitant of this county. This singular bird is generally fond of uninhabited places, has been observed to frequent the hill of Hay, and other elevated spots in the Orkney isles. It does not, like others of the same tribe, alight on trees; but lies under long grass or stubble, where it sits looking composedly at the person who attempts to disturb him. Like the hawk, he flies to seek his food by day. He is a bird of passage, and migrates about the same time as the woodcock, travelling northwards towards the Shetland isles, and thence to Norway.

The *corvus cornix*, or hooded crow, commonly called the Royton crow, from the number which frequent the vicinity of the town of that name in Cambridgeshire, is frequently an unwelcome visitant of the marshes. This species is more injurious than any other of the genus.

That singular and proteus-like species of the sand-piper, the *tringa pugnax*, is found in this county. The males are called *ruffs*, and the females *reeves*; both are distinguished by a tuft of feathers on the back of their necks, by which they may be discriminated from all other birds.

Environed by a great extent of sea-coast, abounding in rivers and streams, accompanied by numerous broads and meers, Norfolk is well supplied with fresh and salt-water fish. The Bure, and its attendant broads, abound with various kinds; such as pike, tench, trout, perch, &c. The latter are, indeed, so plentiful at times, that the inhabitants at Ranworth report they have witnessed a hundred and twenty bushels having been, by two nets, caught in one day. In the Yare, or in the Wensum, are found a singular species of perch, the *perca cornua*, called a *ruffe*; which Dr. Caius has Latinized into *aspredo*. It is smaller and more slender than the common perch, and seldom

exceeds six inches in length. Two great piscatory concerns are carried on along the coast and the sand-banks in the North sea, the *mackerel* and the *herring* fisheries. The mackerel, a gregarious and migratory fish, appear in vast shoals on this coast in the spring and summer, and during the season furnish an abundant supply of food to the inhabitants, &c. at a very moderate expence. But the *herring-fishery* is the most important and most profitable pursuit. It commences in September, and continues about three months; at which time vast quantities are caught, cured by pickling or drying, and exported to distant places. Of this fishery some account will be given in the subsequent history of Yarmouth.

Minerals, Fossils, &c.—Few parts of the kingdom are so devoid of subterraneous treasures as Norfolk. No mineral or fossil substances have been found sufficient to excite a mining spirit; no veins of that invaluable substance, coal; nor any extent of stratification of useful stone. The strata of the county, as far as researches have discovered, consist of clunch, chalk, in which flints are imbedded, gault, gravel, sand, silt, and peat earth. On Mousehold-heath, and in some other places, there is an expansive substratum of clunch, or indurated chalk, which is used for walls, and burnt for lime. It appears to have been formerly applied in buildings, particularly for coignes, mullions, and tracery of windows; and for sepulchral ornaments, and other works of sculpture, anterior to the general use of alabaster and marble. The chalk-pits in the vicinity of Norwich abound with those large beautiful black flints which compose the walls of many buildings in that city; and the deep pits on Mousehold-heath are probably the places whence they were dug. In the gault, or argillaceous strata, has been found a clay which manufactures into an excellent kind of earthen-ware. Brick-clay abounds in various places, and, with sand, forms bricks of equal quality to those made in the neighbourhood of the metropolis. The silt, or sea-sand, finely pulverized, which is found at various depths, is used for repairing the roads. Through the whole of the fen lands, the peat earth furnishes the poor people with an abundant supply of fuel.

On the shore near Thornham, at low water, is the appearance of a large forest having been at some period interred and swallowed up by the waves. Stools of numerous large timber trees, and many trunks, are to be seen, but so rotten, that they may be penetrated by the spade. These lie in a black mass of vegetable fibres, consisting of decayed branches, leaves, rushes, flags, &c. The extent of this once sylvan tract must have been great from what is discoverable; and at high water, now covered by the tides, is in one spot from five to six hundred acres. No hint of the manner or the time in which this submerison happened can be traced. Nothing like a bog is near, and the whole beach besides is composed of a fine ooze, or marine clay.

Agriculture, artificial Productions, &c.—The agriculture of Norfolk is in a highly respectable state; and when the nature of the soil, and the condition of the country about 50 years ago, be taken into a comparative account, the ability and industry for which the husbandmen of this district have been so long famed, will be justly acknowledged.

The first thing that attracts the eye of the stranger in Norfolk is the fine *tilth* of the soil, and the succession of crops. The mode of cultivating the arable lands is worthy of general imitation, wherever it can be adopted. The plough, which is of an admirable construction, is drawn by two horses harnessed abreast; and these are guided by the person who holds the plough. Instead of working the animals seven or eight hours, without drawing the bit, as is the custom in some

some counties, "they are here worked eight hours in winter, and ten in summer, by two journeys, as they are termed, which enables them to do considerably more than they would by one journey." The ploughings are repeated till the land is in high tilth, when it is completely pulverized with drags and harrows, which are violently drawn, by the horses being kept on a trotting pace. The ridiculous custom of letting the land lie idle one year in every three, for the advantage of what is termed *fallowing*, is here very properly exploded. The necessity of it is superseded, and the reasons for it done away, by a judicious course of cropping; so that one crop may fertilize, as another exhausts. The mode of cropping, in general practice, is what is termed a *six course shift*, viz. first year, wheat; second, barley, with or without clover; third, turnips; fourth, barley or oats, with or without clover; fifth, clover mown for hay; sixth, grazed and ploughed up for wheat again. The average crops of the whole county may be stated at three quarters of wheat, and four of barley, and other articles in proportion, *per acre*.

Oats are sown only as a shifting crop, and there are seldom more raised than what are consumed within the county. Other crops are rye, buck-wheat, peas, beans, vetches, or tares, cole-seed, clovers, rye and other artificial grasses; burnet, cocksfoot, chickery, cabbages, mangel-wurzel, lucerne, carrots, and pota'oes. Among what are termed *irregular* crops may be reckoned *mustard*, which is much cultivated between March and Wisbeach. Saffron is also grown in the south-western district, and in some parts adjacent to Cambridgeshire. Flax is cultivated in the vicinity of Downham, and near Outwell. Hemp is also grown near Old Buckenham, Difs, Harleston, &c. but not in such abundance as might be expected.

Butter is made here in considerable quantities, and exported under the name of *Cambridge butter*. The prevailing system being arable, the grass lands of Norfolk have been too generally neglected: but by the late practice of marling, they are now greatly improved; and by the adoption of under-draining and irrigation, the grazing land is experiencing very considerable advantages.

Of particular Improvements, &c.—The part of husbandry in which Norfolk stands pre-eminent, and which has led to established excellence, is the management of its turnip crops. This valuable winter root was only cultivated in gardens, as a culinary plant, in this country, till the reign of George I., when viscount Townshend, who had attended the king to Hanover as secretary of state, observing the profit and utility of the field cultivation of turnips in that electorate, on his return brought with him the seed, and recommended it to his tenants in Norfolk, who occupied land of a similar quality to that of Hanover. The experiment succeeded equal to expectation, and the practice gradually spread over the county, and made its way into several other parts of the kingdom. This important root has been progressively rising to its present state for upwards of 70 years. "A good acre of turnips in Norfolk will produce between 30 and 40 cart-loads, as heavy as three horses can draw; and an acre will fatten a Scotch bullock from 40 to 50 stone, or eight sheep. But the advantage of this crop ends not here; for it generally leaves the land so clean, and in such fine condition, that it almost insures a good crop of barley, and kind plant of clover; and the clover is a most excellent preparative for wheat, so that, in the subsequent advantages, the value of the turnip can scarcely be estimated."

No county has exhibited a greater variety and number of implements for facilitating the operations of husbandry than Norfolk, nor evinced more readiness in applying them to practice. Among wheel-carriages, the non-descript one,

called a *wizzard*, or *hermaphrodite*, is curious. It is the common cart, to which, in harvest, or under pressing circumstances, a couple of temporary fore-wheels are placed under the shafts, and two oblique ladders to the frame, by which it is made to answer the purpose of a waggon: "and in small farms it is a real object of utility; and in large ones, of great assistance in a busy season." Drills are of all kinds, but a drill-roller is perhaps peculiar to this county. It is a large cast-iron cylinder, with projecting rings round it, at about ten inches distance from each other. This being drawn over the ploughed land, makes indentations, and the seed sown broad-cast, chiefly falls into the drills, and is thus more regularly and better deposited than in the common mode of sowing.

The powers of steam were first applied to the purposes of agriculture in this county, and the first steam-engine was set up by colonel Buller of Haydon. It possesses the power of ten horses; turns a large threshing machine, a corn-mill, a chaff-cutter, and performs at the same time several other labours of manual husbandry. On Mr. Coke's farm an improvement on temporary fencing has been adopted, worthy of universal imitation. It is the application of moveable gates and posts with hurdles, for partially eating off turnips, or depasturing grass lands. Regaining land from the sea has, in several instances, been successfully practised. At Tichwell, 300 acres were embanked in the year 1786: in 1790, 868 acres were embanked and enclosed in the parishes of Terrington St. Clement, and Terrington St. John. But the chief improvement of this kind, which has hitherto been made, was performed in Marshland by count Bentinck, who, in the prosecution of his plan, lost his life. His son has, however, continued to pursue it, and perseverance has crowned him with ample success. The count's embankment extends about four miles in length.

Ancient History and Antiquities of the County.—Anterior to the Roman colonization of Britain, the district now called Norfolk, with the contiguous country, was peopled by a tribe of Britons called Icenii, and another class denominated Cenomanni, or Cenimagni. According to Whitaker, (*History of Manchester*, vol. i. 62. 149.) the latter occupied Caistor, near Norwich, as their *venta*, or chief city. These, as well as the Trinobantes, who were placed to the south of the former, were repeatedly assailed, and often subdued by the Romans; and the latter being ultimately conquered, the whole established several military posts, or stations, in this district, as permanent habitations for themselves, and to overawe the conquered natives. Five of these stations were formed and garrisoned within the limits of this county, or in its immediate vicinity, viz. Branudonum, Garianonum, Venta-Icenorum, Sitomagus, and Ad-Tuam; besides which, several subordinate, *Castra-Estiva*, and *Stativa-Hiberna*, were also formed. Of the latter kind, according to some writers, were Buxton, Caistor near Yarmouth, Buckenham, Castle-Acre, and Elham. At these places have been discovered several coins, urns, and other remains of that people. These and other fortifications, intended to intimidate the Britons, as well as to repel invasion, were placed under the supreme command of an officer, whose title, agreeably to some authors, was "*Comes tractus maritimi*;" and others have it "*Comes litoris Saxonici*," i. e. Count of the Saxon shore. Under his controul the stations on the east side of the island were placed, the garrisons of which are stated to have consisted of 2200 infantry, and 200 cavalry. These numbers are set down in the *Notitia*, which was written in the reign of the younger Theodosius, about the year 410. But as this allowance of troops was inadequate for the defence of each station, and consequently insufficient

to subdue insurrection, it is probable that to the Romans were joined British conscript troops, not included in this enumeration; as we find that, about 20 years after, the imperial armies in this country were comprised chiefly of British auxiliaries, which, together with the few remaining Roman troops, were recalled to defend the Roman capital by Maximus and Constantine.

The first Saxon leader who established himself in this part of the island was Uffa, who, A.D. 575, assumed dominion over that part of the country which at present comprises Norfolk, Suffolk, and Cambridgeshire, giving it the appellation of East Anglia; and the inhabitants were denominated Uffagines. About this period it is highly probable that the city of Norwich arose out of the Venta-Icenorum of the Britons and Romans; and, from its relative bearing to the old city, was called by the Saxons North-ick, or Northwick.

Uffa, who died A.D. 578, was succeeded by his son Titist, on whose demise, 599, his son Redwald assumed the reins of government, and embraced Christianity; but, through the influence of his wife, renounced it again. He was succeeded, A.D. 624, by his son Erwald, who was assassinated by a relation, named Richbert, A.D. 633. His half-brother Sigebert, or Sigbercht, succeeded to the crown, in whose reign the bishopric of Dunwich in Suffolk was established, and the first ceremony for religious instruction formed, which led to the establishment of an university at Cambridge. Fatigued with the burthen of government, he resigned both his crown and its cares, A.D. 644, to his kinsman Egric. The Saxon governments were now at variance amongst themselves. Penda, king of Mercia, commenced hostilities against Egric, who called Sigebert from his monastic retirement to head his army. They were defeated, and both slain in battle. Anna, nephew of Redwald, ascended the throne, restored Cenwalch to his kingdom of Wessex, and became the most celebrated of the East-Anglian princes. But Penda bringing against him the powerful resources of Mercia, he fell in battle, A.D. 654. From this period, the Mercian princes seem to have dictated in the choice of monarchs to the East-Angles; and in the year 792, Offa, king of Mercia, united the kingdom of East-Anglia with his own; and subsequently it became successively subject to the power of Mercia, or of Kent. After the whole Saxon kingdoms had been united under one monarchy, the Danes made occasional descents on this coast. They first came under the command of Hungar and Hubba, in the year 870, and landed their troops near Redeham, opposite the town of Yarmouth. They soon became formidable, and, previous to the death of Egbert, they possessed the whole of East Anglia. On the demise of that monarch, Ethelwolf obtained the crown of England. He was totally unequal to the task of succeeding so puissant a prince as his father, at this momentous crisis. The Danes proved too powerful and subtle for his military knowledge and strength. In numerous engagements they routed and defeated his armies. He died in the year 857, and was succeeded by Ethelbald his son, who died A.D. 860, when his eldest brother assumed the government. Ethelred, the third brother, came to the throne in 866. In his reign, the Danes extended their ravages over the greatest part of his dominions; but under the martial spirit and proofs of his younger brother, Alfred, then invested with the title and authority of earl and field-marshal, they received a severe check; and by the continued reverses they experienced, were constrained to abandon East Anglia entirely, and concentrate their forces in Wessex, where several desperate battles were fought with various success, in one of which Ethelred

was mortally wounded; and dying in 872, Alfred ascended the throne, and ultimately succeeded in conquering the Danes. He compelled the chieftains and their followers to receive Christian baptism, and allotted the province of East Anglia for their limited residence. Here the Danes became domesticated: they built houses, and improved the lands, were admitted to the privileges of Englishmen, and received a code of laws for their regulation from Alfred. The Danish chief had fixed his seat of viccroyalty sometimes at Cambridge, and sometimes at Norwich; but after this signal defeat, and consequent restriction, the principal residence of these marauders was the latter city. From that period, Norwich continued a royal castle, and the county remained, with the other parts of the province, in possession of the Saxon line, through the succeeding reigns of Athelstan, Edmund, Edred or Eldred, Edwin or Edwy, Edgar, and Edward the Martyr. In the reign of Ethelred II., the Danes again became extremely troublesome, and, A.D. 992, invaded with considerable force East-Anglia, and proceeding as far as London, invested that city. To revenge this outrage, Sweyne, king of Denmark, assembled a numerous army, and with a powerful fleet invaded England; and landing on the coast of Norfolk, burnt the cities of Norwich and Thetford, and was proceeding to devastate every part of the country. During the whole of the Danish dynasty, this county was the theatre of many severe conflicts; and as the Danish chiefs prevailed, they either took possession for themselves, or for some leader, of a strong fortress or town.

In the time of William Rufus Norfolk was a scene of confusion, in consequence of Roger Bigod having confederated with Robert Curthose against the king, in which contest the county suffered very considerable devastation. During the commotions excited in the kingdom by the unnatural attempt of prince Henry to wrest the crown from the head of his father king Henry II., this county largely participated in the disasters which arise from civil discord. Earl Bigod espoused the prince's cause, but the king's troops being victorious, the Flemings in the pay of the prince were permitted to return to their own country, and Bigod purchased his peace at the expence of 1000 marks.

In the turbulent reign of John, Roger Bigod, earl of Norfolk, took part with the refractory barons. And while they were taking towns and cities in one part of the kingdom, John was laying waste with fire and sword the baronial possessions in another. In this career he came to Lynn, where, being well received, he crossed the washes, with the loss of his baggage, to the abbey of Swineshead, in his way to Newark castle, where he died. After this period, the county was overrun by prince Lewis, who exacted heavy contributions. In Richard II.'s time, a powerful insurrection broke out, under two brothers, John and Matthew Tiler, commonly called Jack Straw and Wat Tiler, whose standards were joined by numbers of the lower classes, and Norwich was invested by the rebels collected under one Lislester. But he being taken and arraigned for treason, was condemned to be hanged, drawn, and quartered; one portion of his body to be suspended at his own house, one in the city of Norwich, one at Lynn, and another at Yarmouth; this so dispirited his adherents, that they dispersed, and an end was put to the rebellion of the Norfolk levellers. Two rebellions broke out in the reign of Edward VI. owing to a system of enclosing adopted by the nobility and gentry, who had been put in possession of the abbey lands. Though they happened in remote parts, Norfolk and Devon, the coincidence of these shew that they were the consequence of previous communications, and a preconceived plan. The rebels

rebels having imbibed the spirit of the ancient levellers, abolishing distinction of ranks, they proceeded to execute their nefarious designs under two ring-leaders, of the names of Ket. They fixed their grand rendezvous on Mousehold-heath, near Norwich. Here the elder, Robert Ket, with assiduous deputies from every hundred, held his councils under a large tree, styled the Oak of Reformation, from which he pretended to administer justice, and issued his edicts for contributions. Long did the country labour under the exactions and other acts of outrage committed by this banditti; all attempts to quell the insurrection having been ineffectual, till a large army, raised to proceed against the Scots, was sent against the insurgents, under the command of the earl of Warwick, when Robert Ket was taken, and the rebels dispersed. At the commencement of the unhappy dissensions which arose between Charles I. and his disaffected subjects, Norfolk took a decisive part. When the parliament had voted the necessity of taking up arms July 12th, 1642, the inhabitants of this county generally approved of that determination. At an early period of the contest, Norwich was fortified against the royal party. Norfolk formed one of the associated counties placed under the command of the earl of Manchester; the others were Suffolk, Cambridge, Hertford, and Essex, to which Lincoln was afterwards added. In 1643, a tax was levied by parliament for the use of its army, to be paid by weekly installments. This county contributed 1250l.

Encampments, Roman Roads, &c.—It is evident that Norfolk must have been the region of many battles, and have been alternately occupied by warriors of different nations and parties. In proportion to the power and skill of these, would be the fortifications they constructed; and as the latter were destroyed, or injured, they would be enlarged and altered by successive possessors. In addition to the five Roman stations already mentioned, some writers have considered Ichborough, north of Brandon, as a sixth; and have identified it as the Ictani of the Itinerary. Roman coins, and other vestiges, have been found in various parts of the county, particularly at Brompton, Buckenham, and at Thetford, but these furnish no decisive proof that such places have either been occupied by the Romans as stationary or as exploratory camps.

At South Creak, in the north part of the county, where a desperate battle was fought between the Anglo-Saxons and the Danes, are vestiges of a circular encampment, which still retains the name of Blood-gate. Near Weeting are the remains of another, consisting of a vallum and foss, known by the name of the Foss. Near it are places of sepulture, called "Grimes Graves." At Narborough is a small circular fort, said to have been occupied, if not thrown up, by the Danes, when they landed on this part of the coast, A.D. 1003.

Besides the military fortifications in the county, several of the old halls were formerly encompassed with moats, and their entrances protected by towers, strong doors, bridges, &c. Remains of some of these features are still preserved in Oxborough-hall, Stifkey-hall, Caistor-castle, Baconsthorpe-hall, Hunsington-hall, Gaywood, Scales-hall, Fincham-hall, &c.

Of the *viae militares*, or great Roman roads, made for the convenience of carriages, and facilitating the marching of the army, few perfect vestiges remain in Norfolk. But as several important stations were formed within the county, no doubt can be entertained that such roads once existed, though the traces of most of them are now obliterated. It was the custom of the Romans to open this kind of communication between all their stations, and many appearances of

such are still to be seen in those parts of the adjoining county of Cambridge which abut upon this; and in a direction as if they had come from the eastern part. A great Roman road connected the south-eastern and north-western parts of the kingdom; and another formed a similar communication between the north-eastern and the south-western extremities. This commencing on the coast of Norfolk, probably at Burg, near Yarmouth, passed by Caistor, and is now conspicuous near Downham; crossing the river Ouse, it passes through the fens into Cambridgeshire, and proceeding through the central counties, joins the Julia-strata, and terminates at St. David's Head. Sir William Dugdale says it was discovered in the fens sixty feet wide, and three feet deep, and formed of compact gravel. Its direction was from Downham in Norfolk, through Plaitfield and Charke to the high grounds about March; then it proceeded by Eldon-hall to Wittlesea and Peterborough, from which last place it has recently been traced to Caistor in Northamptonshire.

Of the *chimini minores*, or vicinal roads, some traces are still visible. What is called Pedders-way, passing from Thetford by Ichborough, Swaffham, Castle-Acre, Fring, Ringhead, to the sea near Brancaster, appears one of this sort. The road leading by Long-Stratton to Tasburg was probably another, whilst a third branched off from this to the north-west, going through Marfild, Upwell, and Elm, to Wisbeach. What is called the *Milky-way* has been considered Roman; but it is more probable of later date, and was possibly made for the convenience of the devotees who went on a pilgrimage to the chapel of our Lady of Walsingham. It is traceable in several places, and is pretty perfect in the vicinity of Grimes-Graves.

Several barrows or tumuli are to be found in different parts of the county, particularly in the neighbourhood of Creek, Amnor, Rudham, Sedgford, Stifkey, Long-Stratton, Weeting, Norwich, and Walsingham. In some, which have been opened, different relics have been discovered, as human bones, wood-ashes, and urns made of baked clay. These were sometimes encompassed with large stones, forming a sort of cell or kistvaen; and in some of the barrows have been discovered missile instruments, with implements, which are considered by some antiquaries to have been originally employed in sacrifice.

On Mousehold-heath, near Norwich, are many excavations in the earth, which Mr. King and some other antiquaries have called hiding pits, or British caves. Several of similar character are to be seen on the downs of Wiltshire and Dorsetshire.

Ecclesiastical History and Jurisdiction of the Diocese.—Soon after the settlement of the Saxons in East Anglia, the Christian religion was introduced into this part of the island; and it is related that Sigebert, son of Roderic, king of the East Angles, was the first to establish it here. He had been banished, by his eldest brother Erpenwald, into France, where he contracted an intimacy with a religious Burgundian, named Felix, who prevailed on him to adopt the Christian faith. On the death of Erpenwald, Sigebert returned to Britain, and succeeded his brother as king of East Anglia. His predilection, after his conversion, increased towards Felix, who had accompanied him from France. He first made him chaplain and confessor, and then encouraged him to undertake the conversion of his subjects. Upon this arduous task, so congenial to his mind, Felix cheerfully entered. Charmed by the impressive eloquence of the evangelist, and incited by the royal example, numerous converts were soon made; schools were instituted and churches erected for public worship. Over these Felix was appointed

prebide under the title of bishop, and after having been consecrated by Honorius, archbishop of Canterbury, A.D. 630, he fixed his seat at Silthetow, afterwards called Dunwich, in the county of Suffolk. Such were his piety and zeal, and so extensive was the fame which he acquired by his eminent services in the church, that after his death, which happened in the year 647, he was canonized as a saint, and his festival, which was annually kept, stands on the eighth of March in the Romish calendar.

Thomas, who had been deacon to Felix, succeeded him. In his declining years, infirm and unable to perform the duties of his diocese, he obtained permission to divide the bishopric into two sees, fixing one at Dunwich in Suffolk, and the other at North Elmham in Norfolk. Subsequent to this partition of the East Anglian diocese, the bishops of North Elmham were as follows.

1. Bedwinus, Baldwinus, or Beadwine, was consecrated 673, and assisted Acea, in 675, to place the veil upon St. Offyth.
2. Northbertus, Northbert, or Rothbert, succeeded Bedwinus some time after the year 679.
3. Hedulacus, Haduac, or Hatholac, was bishop of this see at the time Bede completed his Ecclesiastical History, in A.D. 731.
4. Edelfridus, Ethelfrith, or Ethelferth, succeeded, and
5. Lamferthus, or Lameferd, followed; but at what time is not satisfactorily ascertained.
6. Athelwalfus, or Æthelwolph, occupied the see in 811.
7. Unfertus, Alberth, or Alcar, was bishop, according to Blomefield, about the year 787.
8. Sibba, Sibban, or Siga, sat in the year 816.
9. Hunferth, Hunferd, or Hufred, was consecrated by Wilfred, archbishop of Canterbury, and was living in the year 824.
10. Humbert, or Humbret, was consecrated about 826.
11. Wybred, Wyred, or Wildred, was appointed bishop of both the sees of Norfolk and Suffolk.

Bishops of Elmham after the Union of the Sees.—1. Theodred I., or Tedred, is reported to have been an eye-witness of St. Edmund's corpse being found uncorrupt. A.D. 945.

2. Theodred II., surnamed the Good, was first bishop of London, and then of Elmham, both of which he held until his death, some time after A.D. 962.

3. Athulf, Adulf, or Eadulf, has been erroneously placed as sitting prior to the Theodreds in this see.

4. Alfric, Alfrid, or Ailfric, was one of the number who signed the charter of king Edgar to the abbey of Croyland, in the county of Lincoln. He died at the end of Edgar's reign in 975.

5. Athelstane, Edelstane, or Elstane, was consecrated at the end of the same year.

6. St. Algare, or Algane, who had been confessor to Dunstan, archbishop of Canterbury, was promoted to this see in the year 1012. Died Christmas eve, A.D. 1021.

7. Alfwin, Elfwin, or Eldwin, succeeded the same year. He resigned, or died, A.D. 1031.

8. Alfric II., Ailfric, or Aluric, succeeded and died A.D. 1038.

9. Alfric III., surnamed the Little, who had previously been prior of Ely, died A.D. 1139.

10. Stigand, who was chaplain to king Harold Harefoot having obtained this see by simony, was ejected by king Hardicanute 1040.

11. Grimketel, or Grumketel, held it in commendam

with the bishopric of the South Saxons, during the remainder of Hardicanute's reign.

12. Egelmor, or Almar, on the advancement of his brother Stigand, succeeded in the year 1067.

13. Herfast, or Arfall, chaplain to William the Conqueror, was made bishop at Easter, 1070.

A list of the bishops of Norwich will be given in a subsequent account of that city.

Extent, Jurisdiction, Revenues, and Liberties of the Diocese.

—The diocese of Norwich comprises the counties of Norfolk and Suffolk, except four peculiars in the latter county; three of which belong to the see of Canterbury, viz. Hadleigh, Monk's Illich, and Moulton; and Frekenham to the see of Rochester. It includes also fifteen or sixteen parishes in Cambridgeshire. Spelman says, the diocese contains 1121 parishes, and Beatson, in his Political Index, repeats the same enumeration; but this, if meant of unconsolidated livings, must be very erroneous, as, A.D. 1371, bishop Henry Spenser certified to the king, that there were in his diocese 1321 parishes. And if meant to include pluralities as parishes, it will then be far from accurate. Various changes have, however, taken place in this respect, and the number is occasionally fluctuating from different causes. The number of established clergy resident in the diocese, according to a calculation made in the year 1772, was beneficed clergy 550, curates 150, from which it is evident there must be a number of pluralities. Mr. Young remarks, that not half the clergymen reside at their livings.

An answer returned to a mandamus of queen Elizabeth, by bishop Parker in 1563, states, that "the diocese contains Norfolk and Suffolk, except four peculiars and eleven churches in Cambridgeshire, besides churches void, chapels, and donatives. Thus in the archdeacons:—"

	Deaneries.	Rectories.	Vicarages.	Void Churches.
Norwich	12	168	41	80
Norfolk	12	184	36	uncertain.
Suffolk	13	114	42	—
Sudbury	8	182	31	—

The present enumeration from the best information that can be obtained is 1354, viz. 802 in Norfolk, 537 in Suffolk, and 15 in Cambridgeshire. Formerly there was but one archdeaconry, that of Norfolk. Sudbury was added in the year 1126, Suffolk in 1127, and Norwich in 1200; those are subdivided into 47 deaneries, and these, as apportioned to each archdeaconry, are as follows, with the number of parishes contained in each:

Archdeacons.	Deaneries.	Parishes.
Norwich	13	365
Norfolk	12	468
Sudbury	8	523
Suffolk	14	

The diocese is in the province of Canterbury, and the bishop is a suffragan to that metropolitan. The jurisdiction of the see, as respects its internal regulations, is vested in the bishop, who appoints the four archdeacons as his assistants, (no suffragans having been chosen since the time of bishop Nix) a chancellor, a registrar, and other officers of his consistorial court.

Revenues.—Nurtured by kings, and long under the fostering care of royalty, this diocese rapidly increased in wealth, so that at the time of the great Norman survey the revenues of it were very considerable, as appears from the enumeration of them in Domesday book. Subsequent to that era, the bishops of Norwich were generally in the court favour; and

and as favourites were preferred to the highest stations of emoluments and trust, the see often gained some acquisition of wealth from succeeding prelates. In the Conqueror's inquest, there is an account taken of twenty-seven manors belonging to this see, besides advowsons, fee-farm rents, &c. Bishop Beaufort died possessed of forty-three manors, many of which, at his death, were by his will annexed to the episcopal possessions. Hence it appears, that at the time Herfast came to it, the see was seized, on a moderate computation, of sixty manors; and the pipe rolls of king John's reign evince, that bishop John de Grey, in 1212, answered for thirty-five knights' fees; and in the following year obtained a *quietus*, or writ of acquittance, from the Scotch scutage, for forty-eight knights' fees and three quarters. And although by a multiplicity of changes from the varied complexion of the times, and the political character of the prelates, these were frequently diminished, yet by the act passed February 4th, 1535, which vested the revenues of the diocese in the power of the king, it appears that the bishop possessed twenty-three manors, seventy-three livings, ten palaces, all the knights' fees of the barony, and the first fruits of the whole diocese, what no archbishop ever possessed; exclusive of all other episcopal sources of emolument. By virtue of that act, the whole of these were alienated for ever from the see, except a few presentations, and the palace of Norwich. In lieu of them, to give a kind of colouring to the glaring acts of rapacity, the comparatively small revenues of Holme abbey were granted to the bishop; and the nefarious transaction was glossed over under the name of an *exchange*. Some few additions were made in the reigns of king Edward VI., and queen Elizabeth. The bishopric stands charged at present in the king's books at 834*l.* 11*s.* 7*d.* It pays first-fruits but no tenths, those having been discharged by a commutation with queen Elizabeth for the episcopal manors of Sudborne and Swanton. The present clear yearly value is uncertain, but on the average it is computed to amount to about three thousand five hundred pounds *per annum*.

Liberties.—At an early period this see enjoyed extensive privileges as well as great revenues. To enumerate them would fill several pages. The bishop possessed all the usual powers granted to lay baronies, the liberty of coinage, exemption from all taxes, tallage, and customs, except those of the city of London, jura regalia, within his manors, a coroner, and a prison for his liberty, and all mulcts, amerciaments from his tenants; the right of choosing a justice for the precinct of his palace, and of acting himself as one of the king's justices of the peace for the city, county, and liberty. All these were confirmed by a charter of *infleximus*, granted by king Henry VIII. March 29, A.D. 1512. But through many ancient statutes becoming obsolete, the abolition of feudal customs, and various subsequent parliamentary regulations, many of these privileges are abridged if not disannulled. There is, however, one which the bishops of Norwich have exercised time immemorial, and as it is peculiar to this diocese ought not to be omitted. It is the power of uniting any two cures within the diocese, at the time of institution, without regard to their value, and that either by personal or perpetual union. The personal union lasts only during the life of an incumbent, and answers to an archiepiscopal dispensation, requiring in this diocese only the bishop's consent. The perpetual union is made with the joint consent of patron, incumbent, and bishop, and is equal to a consolidation. The bishop is a peer of the realm, and sits in the upper house, not only in right of his barony, but as titular abbot of St. Bennet's in Holme; and is the only abbot at present in England.

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Abbies, Priors, and other religious Houses.—From the preceding account of the prelacy of this see, it appears that the Christian religion lost much of its intrinsic excellence by its connection with secular interests, and to what a prodigious height of power, wealth, and grandeur, the church had arisen prior to the reformation. In the account of the monastic institutions, this will appear still more evident, and the abuses which followed such unwarrantable acquisitions, will be displayed in a more prominent degree.

Norfolk teemed with religious houses; out of one thousand one hundred and forty-eight monasteries seized by Henry VIII. after his denial of the papal supremacy, seventy-nine religious or charitable foundations were suppressed in this county.

Norfolk contained several alien priories, which were dissolved before the general suppression, and a few decayed hospitals, whose revenues had been sequestered and appropriated to other uses.

Ancient Architecture.—From the various circumstances already mentioned, it may with great probability be inferred, that Norfolk contains various and numerous specimens of ecclesiastical architecture; and from the many military transactions which occurred within this district, the antiquary may expect to meet with several castellated remains. Norfolk contains the following castles, the chief of which were built or materially altered by the first Norman barons. Norwich castle at present merely consists of part of the large square keep in the upper ballium, standing on a lofty conical hill, and surrounded by a deep and wide foss.

Castle Acre.—The fortifications of this place are extensive and bold. Parts of the wall of the circular keep and some other fragments remain.

Castle Rising.—This castle displays features very dissimilar to either of the former, and totally different to the generality of fortifications.

At *Middleton*, near Lynn, is a fine gatehouse or entrance to a castellated structure. Caistor-hall, near Yarmouth; Oxborough-hall, near Stoke; Winwall-house, near Stoke; Stifkey-hall, near Walsingham, and Baconthorpe-hall; are ancient mansions, all of which exhibit some features of a castellated character, though they do not appear to have been regularly and completely fortified.

In the class of *Ecclesiastical Architecture*, Norfolk presents more curious and ancient than what may be termed *fine* buildings. Of those old churches, towers, &c. which are commonly called Saxon and Danish, many specimens are to be found in this county; and it would be highly gratifying to laudable curiosity to ascertain whether they were really erected by either the Saxons or the Danes, during their alternate dominion in East Anglia.

The round towers, of which several still remain in Norfolk and Suffolk, have been called Danish by sir James Burrough and by some other antiquaries; and their being found principally in this part of the island strengthens that opinion. Though of a circular form, they are dissimilar in size and height to the pillar towers of Ireland, and are still more unlike the circular churches. The architecture, if their construction be entitled to this term, is very simple or rude; they consist of a plain wall of flint, rubbish, stone and mortar, with very small openings or windows in them. The latter are towards the top, and have semicircular heads divided into two apertures, with a column between. The parish church of Bexwell near Downham, and that of Bychamwell near Swaffham, have round towers. Besides the acknowledged high antiquity of that form, there is in each a circumstance certainly not common: both have been surmounted by octagon tops about the age of Henry VII. In that of Bex-

O

well

well are ten small windows with semicircular heads furrounding the upper part, but are now bricked up. In that at Bychamwell are four pointed apertures, nearly in the same situation as the windows in the other tower: the arched parts of these and the sides are formed by plain squared stones, and the former are disposed in the shape of an acute triangle. The tower is of very remote antiquity, and the pointed loops or windows are coeval with the original building. Mr. King, author of *Munimenta Antiqua*, considers these structures to be Saxon, and says, "another of these round Saxon towers is at Wittingham church, near Trowse in Norfolk, only its top has been raised in height and repaired." Other specimens of the ancient circular or Saxon style of architecture are displayed in the following buildings.

The church at South Runcton near Downham, now in ruins, has a semicircular east end: and it may be observed that a church in this manor was given to the famous abbey at Bury in the time of king Canute.

Thwaite church, near Bungay, has a fine semicircular arch of entrance on the south side.

In St. Julian's church at Norwich, was formerly an ornamental arched entrance of a similar kind.

The most curious and interesting specimen of the ancient churches is that at Castle Rising.

Of the large and magnificent Norman churches a few fine examples are to be found in this county, the principal of which is the cathedral church of Norwich. This noble edifice displays several interesting specimens of massy columns and semicircular arches, with numerous appropriate mouldings, capitals, bases, &c. In the ruined churches of Wymondham, Attlebury, Binham, Castle-Acre, and St. Margaret's at Lynn, are several examples of nearly the same style and age, and all display considerable grandeur of design with stability of construction. Examples of a later and more elegant style of architecture are seen in St. Nicholas chapel at Lynn, and the Lady Mount chapel at the same place; in the fragment of Walsingham priory church; in the churches of St. Peter Mancroft and St. George's, &c. at Norwich; in those of Hingham, Aylesham, Cromer, Fakenham, East Deerham, Swaffham, &c. Several of these buildings are ornamented with screens, piscinas, monuments, fonts, &c. Of the latter, particularly fine specimens are to be found in the churches of Binham, Norwich, Walsingham, and Wymondham.

The buildings of a county are usually constructed with the natural materials of the district, whence the geological character of a province may be generally ascertained by its public structures; thus, Norfolk producing scarcely any stone, the builders were obliged to substitute flints, as being very abundant. These, being usually found in small irregular pieces, were not easily adapted to flat surfaces, or to facilitate the making of a wall. In large castellated structures, where the walls were required to be very thick, they proved superior to any other substance; but in those buildings they were commonly enclosed with squared stones, and strongly cemented with fluid mortar. In this manner they are used in the walls of Gariannonum and of Venta Icenorum; also in Norwich castle, Castle Rising, and in several old churches in this county. In the former Mr. Wilkins, in *Archæologia* states, that "alternate courses of squared flints were employed." The same scientific architect further observes, that "no material whatever can exceed the durability of flints; for we do not find an instance any where of their perishing by frosty or wet weather; and when squared or laid with care they are extremely beautiful. In building, notwithstanding, they have but little bond, and depend much on the mortar cement they are fixed with; for if wet by

any means gets behind them the frost soon levels the work." Many, indeed most, of our churches and public buildings in this county are built almost wholly of this material; but the most remarkable I have observed in flints faced and squared, and laid in small regular courses, is the convent gate to Norwich cathedral, which was built in the reign of Edward I., where the walls to the east and the south have a tracery work formed with free-stone, and the intervals are filled with square flints; and some about Erpingham's-gate, built in penance for Lollardism in the reign of Richard II. The chapel of the Virgin Mary on the south side of St. Michael's Coslany church, which is indeed a master-piece (where the stone tracery is beautifully filled with black flints, as resemble such old cabinets as we sometimes see inlaid with ivory), was built about the year 1500: and a building in St. Andrew's parish, which is recorded as a very rare and beautiful piece of flint work, built in 1403, by William Appleyard, who was the first mayor, and served the office in this house, which was afterwards sold to the corporation, and is the present Bridewell. Many country churches have been also built in this way, as at Cromer, &c. in Norfolk, and many in Suffolk and Essex. The art of squaring the flints in this curious manner is now almost totally neglected, though I am convinced it might very soon be brought to perfection again from the facility I observed the workman acquire by a little practice in repairing under my superintendence, in bishop Bagot's time, a tower belonging to the palace." The authorities for the preceding account are, *An Essay towards a Topographical History of the County of Norfolk*, by F. Blomefield, 11 vols. 8vo. A general View of the Agriculture of Norfolk, by A. Young, 8vo. 1804. *General View of the Agriculture of the County of Norfolk*, by N. Kent, 8vo. 1796. *Beauties of England*, vol. xi., by J. Britton, F.S.A.

NORFOLK, a populous maritime county of Massachusetts, in America, lately taken from the southern part of the county of Suffolk, and lying to the southward round the harbour and town of Boston: it contains 20 townships, of which Dedham is the seat of justice. The number of inhabitants is 27,216.—Also, a populous county of Virginia, bounded N. by James' river, which divides it from Warwick. It contains 7758 free inhabitants, and 4735 slaves.—Also, a port of entry, post-town, and seat of justice in the above county, on the E. side of Elizabeth river, immediately below the confluence of the eastern branch. It is the most considerable commercial town in Virginia. The harbour is safe and commodious, and large enough to contain 300 ships. It contains about 500 dwelling-houses, a courthouse, gaol, an Episcopal and Methodist church, a theatre, and an academy. The number of free inhabitants is 4222, and that of slaves is 2724. It is governed by a mayor and several aldermen. It carries on a brisk trade with the West Indies, Europe, and the different states, and constitutes with Portsmouth, which stands on the opposite side of the river, a port of entry. The exports for the year, ending Sept. 30, 1794, amounted in value to 1,660,752 dollars. A canal is formed from the N. branch of Albemarle found in North Carolina to the waters of the S. branch of Elizabeth river, 9 miles from Norfolk; and merchant vessels of the largest size may go within a mile from the mouth of the canal; 114 miles E.S.E. of Richmond. N. lat. 36° 55'. W. long. 76° 28'.—Also, a township in Litchfield county, Connecticut; 15 miles N. of Litchfield, on the Massachusetts line, containing 1749 inhabitants.—Also, a county in Upper Canada, bounded N. and E. by the county of Lincoln and the river Thames, on the W. by lake Erie, until it meets the Barabue (called the Orwell river) thence by a line running

ning N. 16° W. until it intersects the Thames, and thence up the said river until it meets the N.W. boundary of the county of York.

NORFOLK Isle, an island in the South Pacific ocean, of good height, and five leagues in circuit, discovered by captain Cook in October 1774, and so called by him in honour of the noble family of Howard. The captain and his companions found it uninhabited, and were the first persons who ever landed upon it. They met with many trees and plants common at New Zealand, and more especially the flax plant, which is here more luxuriant than in any part of that country; but the chief produce is a sort of spruce-pine, which grows very abundantly, and to a large size, and very straight and tall. This tree resembles the Quebec pine. For about 200 yards from the shore, the ground is so thickly covered with shrubs and plants as hardly to be penetrable further inland. The soil seemed rich and deep. Here were found the same kind of pigeons, parrots, and parroquets, as at New Zealand, rails, and some small birds. The fowls consist of white boobies, gulls, tern, &c. which breed undisturbed on the shores and in the cliffs of the rocks. The isle affords fresh water; and also cabbage-palm, wood-forrel, fow-thistle, and samphire. The cabbage of the tree so called is not only a wholesome vegetable, but very palatable, and affords an agreeable repast. The coast does not want fish, some of which is excellent. It is high-water at the full and change, about one o'clock; and the tide rises and falls about four or five feet perpendicularly. A settlement was made upon this island by a detachment from Port Jackson in 1788, and we learn from lieutenant King, that no vessel of 30 or 40 tons can remain with security through the year in any place round the island, without removing to the lee-side as the wind changes. Anchorage is every where good, as the bottom is a coral sand. The productions of the island are timber for the construction of vessels, pines for masts, and when the flax-plant can be wrought, a sufficiency of cordage for the navy of Great Britain: this plant abounds in the island, and needs no cultivation. In the summer months the sea-coast furnishes turtle. Banana-trees have been found here; the sugar-cane grows well; wines, oranges and lemon-trees are in a thriving state; the potatoe also furnishes two crops annually; melons and pumpkins are very fine, and every kind of garden vegetable prospers. Rice has been sown twice, but it is subject to be blasted by the S.E. winds; however, that which escaped the blight yielded a great increase. Cotton and indigo thrive in some parts of the island. The quantity of ground cleared and cultivated in March 1790, was 30 acres belonging to the crown, and about 18 acres cleared by free people and convicts for their gardens. S. lat. 29° 2' 30". E. long. 168° 16'. Cook's Second Voyage, vol. ii.

NORFOLK, New, a tract of country on the W. coast of North America, extending from Cross Sound to New Cornwall.

NORFOLK Sound, a bay on the north-west coast of America. The women here, as well as at Port Mulgrave, and Hippah, one of Queen Charlotte's islands, ornament, or rather distort, their lips in the manner described under the article *Port des Français*; and, as Dixon says in his Voyage, it should seem, that the female who is ornamented with the largest piece of wood, is generally most respected by her friends, and by the community in general. N. lat. 57° 3'. W. long. from Paris 135° 36'.

NORGES, a town of Asia, in the principality of Georgia, which was taken in 1395 by Timur Bec, who put the inhabitants to the sword and razed the walls.

NORHOLM, a town of Norway, in the diocese of Christianfand; 16 miles N.N.E. of Christianfand.

NORI, a town of Sardinia; 18 miles N.E. of Cagliari.

NORIA, a town of South America, in the province of Cordova; 21 miles N.N.W. of Cordova.

NORICUM, in *Ancient Geography*, a province of Europe, extending along the S. bank of the Danube, from the mouth of the Inn, as far as mount Cetius. Noricum became a province under the reign of Augustus; and, in process of time we find, under the denomination of districts or provinces, "Noricum Ripense," adjacent to the Danube, and "Noricum Mediterraneum." This province was bounded on the N. by the Danube, on the E. by Pannonia, on the S. by a small portion of the Save (Savus), and the Julian Alps, and on the W. by Vindelicia. The population of this province consisted, according to Ptolemy, towards the W. and N., of the Sevacens and the Alauni, called also Ambifontii, and towards the E., of the Norici, the Ambidrani, and the Amblici. Noricum was subject to the Romans in the time of Augustus, and they preserved it from the Germans, the Quadi, the Mascomani, &c. Afterwards the Goths took possession of it, and it has been said that Alaric made it the seat of his empire. At a later period, the Suevi, the Heruli, and the Huns occupied it.

NORIE, in *Geography*, a town of Sweden, in the province of Schonen; 16 miles N.N.W. of Christianstad.

NORIN, a river of Dalmatia, which runs into the Narentza; eight miles below Citluc.

NORIS, HENRY, in *Biography*, a very learned Italian cardinal, descended from a family originally from Ireland, was born at Verona in the year 1631. His father, Alexander, was a literary character, and well known by his writings, particularly by his "History of Germany." Perceiving that his son gave early indications of an excellent understanding, and a love of learning, he determined to do justice to his talents by procuring for him the advantages of a good education. When Henry had arrived at the age of fifteen, he was admitted a pensioner at the Jesuits' college at Rimini, where he went through his course of philosophy. Here he began to study the writings of the fathers, particularly those of St. Augustine; and soon after he took the habit in the convent of the hermits of St. Augustine at Rimini, and applied with incessant assiduity to the study of all the branches of sacred and profane literature, and antiquities in general. When the term of his novitiate expired, he was sent for by the general of his order to Rome, in order that he might pursue his studies with still greater advantage. Here he spent his days, and often his nights too, in close and unwearied application, usually studying fourteen hours a-day. At the age of twenty-one he began his "History of Pelagianism," but his progress in it was necessarily slow, owing to the many employments which were assigned to him, so that several years elapsed before he could give it to the public. It was printed at Florence in the year 1673. In the following year he was invited by the grand duke of Tuscany to become his chaplain, and he also appointed him professor of ecclesiastical history in the university of Pisa. This employment coincided with his wishes, and he retained it many years, possessing not only the esteem and friendship of many learned men, who at that time adorned Tuscany, but also the protection and favour of the cardinal prince Leopold, and that of Cosmo III. In the mean time his "History of Pelagianism" had attracted considerable notice in the learned world, and while it was highly applauded by one party, it excited the most violent censures of others. It was twice submitted to the cognizance of the Inquisition,

and on both occasions was pronounced free from any passages which called for condemnation. From this period (1676) father Noris lived in peace during the space of sixteen years, and continued all that time to teach ecclesiastical history at Pisa, pursued his various studies with indefatigable ardour, and presented the public with some of the fruits of his labours. Among others, he published "*Dissertatio Duplex de duobus Nummis Dioclesiani et Licinii, cum Auctuario Chronologico de votis decennialibus Imperatorum et Cæsarum.*" He also published several pieces in chronology, of which the most considerable was entitled "*Epochæ Syro-Macedonum parænesis ad Joannem Harduinum,*" 1689. This was followed by "*A Dissertation on the Paschal Cycle of the Latins.*" While he was studying at Rome, he became known to queen Christina of Sweden, who entertained a great esteem for him, and professed to read his different publications, as they appeared, with the greatest satisfaction. She made many attempts to engage him to return to Rome, as did likewise the popes Clement X. and Innocent XII. At length, in the year 1692, pope Innocent XII. urged him so strongly on the subject, that he did not deem it prudent any longer to resist, and upon his arrival at Rome, his holiness immediately appointed him sub-librarian of the Vatican. This circumstance excited the jealousy of his enemies, who endeavoured to undermine his reputation by renewing their attacks upon his writings. A commission was appointed by the pope to re-examine them, and to make a full report. So strongly did they speak in favour of father Noris, that his holiness immediately appointed him counsellor to the Inquisition, and in 1695 he raised him to the dignity of cardinal. In 1700 he was nominated librarian of the Vatican. Two years after this, he received directions from the pope to apply himself to the reformation of the calendar, but he had not made much progress in the business, when he was attacked with an incurable dropy, which proved fatal in 1704, at the age of seventy-three. He was one of the most learned men of his time, and was peculiarly well informed in sacred and profane history. His genius was lively and penetrating; his powers of memory very considerable; as a writer his style is correct, pure, and frequently elegant. He was author of many other works besides those already mentioned. The whole of them have been published collectively at Verona 1729—32, in five volumes folio. Morei.

NORMAL LINE, in *Geometry*, is used for a perpendicular line. See **PERPENDICULAR**, and **SUBNORMAL**.

NORMAN, in *Sea Language*, a name given to a short wooden bar, thrust into one of the holes of the windlafs, in a merchant ship, whereon to fasten the cable. It is only used where there is very little strain on the cable, as in a commodious harbour, when the ship is well sheltered from the wind and tide.

NORMAN Architecture, that species of building practised by the Normans after the conquest of England.

This style of building was merely an adoption of that practised by their Saxon predecessors; and, therefore, the Normans are not the inventors of this style of building, as has been generally supposed.

Before we can have any idea of the style of building practised by the Normans, it will first be necessary to shew the characteristic features of the Saxon style, which were thick walls generally without buttresses, which, if introduced, was more for the sake of ornament than strength, as the substance of the walls rendered them unnecessary. The arches employed were all semicircular, or at least, if the pointed arch is to be found, it is to be attributed rather

to an accidental circumstance than to any prevailing taste.

The plan of the first Saxon churches consisted only of a simple oblong extending in its longer dimension from east to west; but in after-times the east end was converted into a semicircle: the north and south sides were each branched out with a wing, so as to give the edifice the form of a cross, and over the intersection of the cross was erected a tower. The entrance was through the west end. The large Saxon churches had three aisles in a breadth, and the walls of the nave were supported by cylindrical or polygonal columns with a regular base and capital, which was generally plain; but it was also sometimes enriched with foliage and even animals. The archivolts of the arches, which rested upon the columns, consisted at first of faces receding from each other in parallel planes and soffits, which were cylindric surfaces perpendicular to the naked or general face of the building. The shafts of the pillars in the most ancient examples were in general plain.

Many discordant opinions have been advanced concerning what really constitutes Norman architecture.

The only material difference between Saxon and Norman architecture appears in the magnitude of the structures of the latter people, and the more frequent use of stone.

The Normans were not the inventors of the pointed arch, as several instances of that species are to be met with prior to the conquest; and, indeed, the first buildings erected by the Normans had circular arches. The frequent use of the pointed arch did not take place till long after the conquest, and even then it was often mixed with the circular in the same building. The changes of the style of architecture were not immediate, but effected in succession, and though but small at a time, the change was great in the end, so that the edifices were much improved in point of grandeur, proportion, and elegance of decoration.

The Norman era may be stated to be from A.D. 1066 to 1154, from the conquest to the death of Stephen.

The Normans greatly increased the dimensions of the churches. The ornaments formerly used in the Saxon arches were retained, and others were added of a much more exuberant kind. The foliage and other carvings were much more elaborate; however, their edifices still wanted the pediments and pinnacles, as in those which afterwards were termed Gothic or pointed.

The prelates in the early Norman reigns were men of consummate skill in architecture; they applied themselves to the rebuilding of cathedral churches, and also the rebuilding of the greater abbeys. No less than fifteen of the twenty-two English cathedrals retain considerable portions, which are undoubtedly Norman workmanship, and of which the several dates are ascertained. The Normans, who either were architects themselves, or under whose auspices architecture flourished, are Gundulph, bishop of Rochester, who flourished from A.D. 1077 to 1107; Mauritius, bishop of London, who flourished from 1086 to 1108; Roger, bishop of Salisbury, from 1107 to 1140; Ernulf, bishop of Rochester, from 1115 to 1125; Alexander, bishop of Lincoln, from 1123 to 1147; Henry of Blois, bishop of Winchester, from 1129 to 1169; and Roger, archbishop of York.

The works of Gundulph may be seen at Rochester, Canterbury, and Peterborough. Mauritius of London built old St. Paul's cathedral; Roger of Salisbury the cathedral of old Sarum; Ernulf completed the work begun by Gundulph at Rochester; Alexander of Lincoln rebuilt his own cathedral; and Henry Blois, bishop of Winchester, a most eminent

eminent architect, built the conventual churches of St. Crops and Rumsey, in Hampshire; but with respect to Roger, archbishop of York, none of his works remain.

By these architects the Norman style of architecture was progressively brought to perfection in England, and it will be easily supposed, that the improvements made by any of them were only adopted in succession.

Many of the churches belonging to the greater abbeys were constructed in this era; but of these, few, indeed, have escaped the general demolition at the reformation.

From A. D. 1155 henceforth the style of ecclesiastical edifices begun to assume other features; and at this period the conquerors became blended with the conquered, and, therefore, the Norman era properly ceases. From this period also we may date the commencement of the pointed arch style, or what is vulgarly called Gothic.

With respect to the military structures of the Normans, they knew they could not live in security without building strong places of defence, they therefore erected a castle upon every lordship, or assimilated with their own, what they found already erected to their hands.

The leading discrimination in a Norman fortress, is a lofty mound of earth thrown up in the centre of the other works, from the excavations necessary in forming the ditch, fosse, or moat. A square or circular tower, consisting of several stories, rose from the upper ballium, or a low circular story of considerable diameter, which was usually approached by very steep stone stairs on the outside.

The gateway or tower of entrance, and the barbican or watch tower, had both of them a communication with the keep. Remarkable instances in the square form are those of the towers of London, Norwich, Rochester, Dover castle, Hedingham (Essex), Bamborough (Northumberland), Porchester, Colchester, Kenilworth, Knareborough, Carisbrooke, and Oxford. Of the circular are Arundel, Pontefract, and Conisburgh (Yorkshire), Lincoln and Tunbridge in Kent. Besides the above stated towers, an irregular form, of which the plan consists of several segments of circles, may be seen in Clifford tower in York, and Berkeley castle, Gloucestershire. These keeps or citadels in subsequent eras underwent no alteration, whatever additions or improvements took place in architecture.

Bishop Gundulph seems to have considered the lofty artificial mound, originally of Danish usage, as unnecessary. His central towers are so lofty as to contain four stories, as was also the case with most other keep towers. The basement was the dungeon without light: the portal or grand entrance was raised many feet above the ground; but his great merit consisted in various architectural contrivances, by which as much security during a siege was given to his keeps by stratagem, as by real strength. The walls were not unfrequently from 12 to 20 feet thick at the base. In the souterrain of the vaulted stone the military engines and stores were deposited. In the thickness of the walls were placed winding staircases, the well for water, the vast oven, enclosed galleries and chimnies, with an aperture open to the sky, and communicating with the dungeon, in which prisoners were confined, and to whom it gave all the light and air they could receive. There was also a kind of flue for conveying food to every part, not more than eight inches in diameter. The state apartment occupied the whole third story, and the staircases leading to it were much more commodious than the others, and even so large as to admit of military engines. Adjoining to the great chamber was the oriel, lighted by a large window embowed within. In Rochester castle the chief room was thirty-two feet high, including the whole space within the walls. The walls of the

ground-floor story had no light, the second had only loop holes; but the third had large arched windows, placed so high as not to be looked through, and so defended by an internal arcade, that no missile weapon could enter or fall with effect. Each floor had its communication with the well. The chimnies were very capacious, projected considerably into the rooms, and rested upon small pillars; and the sinks were so contrived, in an oblique direction, that no weapons could be sent up them.

Gundulph is said to have introduced the architectural ornaments of the ecclesiastical style into fortresses, both within and without. Most of the Norman castles had a richly carved door-case or portal, as the remains of Arundel and Berkeley amply testify. The windows were decorated with moulding, frequently sculptured. Castle Rising, Norfolk, and Norwich abound in admirable specimens of Norman arcades and mouldings.

The great tower of entrance was built at the foot of the artificial mount, from which was a Sally-port, with stone stairs leading to the keep. It contained the portcullis and draw-bridge affixed to the arch-way, and several spacious chambers. In point both of formation of the mount and keep, and their connection with the entrance-tower, the remains of Tunbridge, and the more perfect state of Arundel castle, exhibit a singular resemblance. The walls were protected by strong buttresses, and the round towers had a central space left open to admit the light and air. At Arundel, the corbel stones which supported the beams of timber are still to be seen.

The well-authenticated buildings of Norman construction, erected from before A. D. 1100 to 1150, are the abbeys of Abingdon, Reading, and Cirencester, destroyed; Malling, Kent; Tewkesbury, nave, aisles, transept, and west front; Malmesbury, nave and west front; Buildwas, Salop; St. Botolph, Colchester; Bolton, Yorkshire; Winborn Minster, Dorset; Castle Acre, Norfolk; Dunstable, Bedfordshire; St. Crops, Hants; Romsey, Hants; Furness, Lancashire, the most ancient parts; Llandisfarne, Northumberland; Byland, Yorkshire; Sanercoft, Cumberland; Sherbourn, Dorset; Southwell, Nottinghamshire; Kirkstall, Yorkshire, nave. Of those now named, Tewkesbury, Malmesbury, Winborn Minster, St. Crops, Romsey, and Sherbourn, are now used as parochial churches.

From A. D. 1155, the style of architecture practised by the Normans began to be mixed with new forms and decorations, and at length to be superseded by that much more elegant and lofty style of building, improperly denominated Gothic.

The principal works that may be consulted in Norman architecture, are the *Archæologia*, Carter's *Ancient Architecture of England*, Britton's *Archæological Antiquities of Great Britain*, and Dalaway's *English Architecture*.

NORMAN, Cape, in *Geography*, a cape on the west coast of Newfoundland, on the gulf of St. Lawrence, and the west entrance of the narrow bay of Mauco; 20 leagues from Cape Ferrol. N. lat. $51^{\circ} 39'$. W. long. $55^{\circ} 58'$. High water at full and change, at 9 o'clock.

NORMAN'S Island, a small island of America, near the south-west coast of Martha's Vineyard. N. lat. $41^{\circ} 13'$. W. long. $70^{\circ} 45'$.—Also, a small island in the West Indies; 18 miles E. of St. John, one of the Virgin islands.

NORMANDY, a considerable province of France before the revolution, bounded N. by the English Channel, E. by Picardy and the Isle of France, S. by Beauce, Perche, and Maine, and W. by Bretagne; about 150 miles from E. to W., and 75 from N. to S.; divided into Upper and Lower, and containing many considerable cities and towns.

towns. It is now divided into the departments of the Channel, the Calvados, the Lower Seine, the Eure, the Orne, with a small part of the Eure and Loire; which see respectively.

Under the Roman emperors, this province was the second "Provincia Lugdunensis;" and under the kings of the Franks, it constituted a part of the kingdom of Neustria. It was ceded to piratical Normans, who settled in Neustria, as a fief of France, in 912, by Charles the Simple, who gave his daughter, Gisle, to their duke and leader, Rollo. The succeeding dukes rose to great power, and William, in 1066, became king of England. In 1135 the male line of this king and duke became extinct in the person of Henry I., whose daughter Matilda married Godfrey, count of Anjou; from which marriage sprung Henry II., king of England. Henry III. of England ceded to Louis the Pious, and his successors, all claim to this province, which, till the end of the 14th century, some kings bestowed on their eldest sons, with the title of duke of Normandy, till that of dauphin was instituted. By the animosities between the houses of Orleans and Burgundy, the English had an opportunity of overrunning not only Normandy, but a great part of France. They held the province about thirty years, and were driven out by Charles VII.

NORMANNORUM TERRA. See **TERRA**.

NORMOLOCO, in *Geography*, a town of South America, in the province of Tucuman; 70 miles S. of Salta.

NORNDORFF, a town of Germany, belonging to the lordship of Fugger, on the Schmuter; 12 miles N. of Augsburg.

NORO, a country of Africa, situated south of Cashna, and north of the Niger.

NOROCHI, a town of Mexico, in New Biscay; 95 miles W.S.W. of Parral.

NOROY-LE-BOURG, a town of France, in the department of the Upper Saone, and chief place of a canton, in the district of Vesoul; 6 miles E. of Vesoul. The place contains 1035, and the canton 7813 inhabitants, on a territory of 187½ kilometres, in 18 communes.

NORPUY, a town of Hindoostan, in Bahar; 37 miles S.S.W. of Patna.

NORRALA, a town of Sweden, in Helplingland; 5 miles N.N.W. of Soderhamn.

NORRENT, a town of France, in the straits of Calais, and chief place of a canton, in the district of Bethune. The place contains 1184, and the canton 12,741 inhabitants, on a territory of 142½ kilometres, in 31 communes.

NORRHO, a town of Sweden, in Helplingland; 16 miles N.W. of Hudwickfwall.

NORRIDGEWOCK, a post-town of America, in the state of Maine, situated on Kennebeck river, in Kennebeck county, incorporated in 1788, and containing 633 inhabitants; 35 miles N.W. of Augusta.

NORRIS, JOHN, in *Biography*, an English divine, was born at Collingbourne, in Wiltshire, in 1657, and educated at Winchester school, from whence he removed to Exeter college, Oxford. In 1680 he was chosen fellow of All-Soul's college, where he took his degree of M.A. In 1689 he was presented to the rectory of Newton St. Loo in Somersetshire, and afterwards to that of Bemerton in Wiltshire. He died in 1711, leaving behind him the character of a pious, learned, and very ingenious man, but strongly tinged with the Platonic mysticism. He wrote a defence of the Immortality of the Soul, in opposition to Mr. Dodwell; but his principal work was published in 1688, entitled "The Theory and Regulation of Love, a Moral Essay," intended to demonstrate the reduction of all virtue and vice

to the various modifications of love. He was author of many other works, of which an account may be seen in the *Biographia Britannica*, and also in the *General Biographical Dictionary*.

NORRISTON, or **NOSRITON**, in *Geography*, the principal town of Montgomery county, Pennsylvania, seated on the north bank of the Schuylkill; 20 miles N.W. of Philadelphia; containing about 20 compact houses, a court-house, and gaol, a handsome edifice for the preservation of records, and an observatory near the mansion-seat of the late Dr. Rittenhouse, by whom it was erected, and where he was interred at his particular request, in June 1796. The number of inhabitants is 922. N. lat. 40° 7'. W. long. 75° 24'.

NORRMARK, a town of Sweden, in the government of Abo; 7 miles N.N.E. of Biorneborg.

NORRO, a small island between the coast of Finland and the island of Alan. N. lat. 60° 34'. E. long. 20° 50'.

NORRON, a small island on the west side of the gulf of Bothnia. N. lat. 60° 48'. E. long. 17° 11'.

NORROY, *North-Roy*, *q. d.* Northern king; the title of one of the two provincial kings at arms, or provincial heralds. See **KING at Arms** and **HERALD**.

His jurisdiction lies on the north side of the Trent, whence his name; as Clarenceux, on the south.

Norroy is the most ancient title of the kings at arms, of whom there have been several at different times in this realm; and perhaps it is the only one in England, taken from the situation of his province, unless "Marche" should be conceived to be of that nature: for as to "Clarenceux," he is not from the place, but "Roy des Clarenceux," from the people inhabiting in that place. It is very probable, that the proper title of this northern king is, as he is often anciently written, "Norreys," and "Norreis," king of arms of people residing in the north; as "Garter" is styled "Roy des Anglois," of the people, and not "d'Angleterre," of the kingdom; for we learn from ancient historians, that the inhabitants of the north were called Norreys. It appears by an authentic document, that there was a king of arms for the parts or people on the north of Trent, in the beginning of the reign of king Edward I.; and he is mentioned again, together with the minstrels, in the 16th year of Edward II.; but in his successor's reign, the title "Norroy" was appropriated to a king of heralds, who is afterwards especially called "Rex Norroy, &c." From the 22d year of king Edward III. to the 9th year of Richard II., no mention is made of any such officer. When Edward IV. obtained the throne, this province was placed again under a king of arms, with the old revived title of "Norroy;" and from that time to the present, the office of Norroy hath been continued without interruption.

NORRSKAR, in *Geography*, a small island on the west side of the gulf of Bothnia. N. lat. 60° 48'. E. long. 17° 11'.

NORS, a river of Sweden, which runs into the Wenner lake, 4 miles N.E. of Gafsta.

NORT, a town of France, in the department of the Lower Loire, and chief place of a canton, in the district of Chateaubriant; 18 miles S. of it. The place contains 3180, and the canton 10,265 inhabitants, on a territory of 267½ kilometres, in 6 communes.—Also, an island of Russia, in the gulf of Finland; 44 miles W. of Revel. N. lat. 59° 15'. E. long. 26° 14'.

NORTELGÅ, or **NOR TELGE**, a sea-port town of Sweden, in the province of Upland, built by Gustavus Adolphus, and in 1622 endowed with the staple and other privileges, but discontinued in 1637. The inhabitants now

subfist

sublitt by navigation and fishing; and near it is a forge for making fire-arms; 30 miles N.E. of Stockholm. N. lat. 59° 46'. E. long. 18° 32'.

NORTGAU, a country of Germany, called also the "Upper Palatinate," of which Amberg is the capital. See **PALATINATE**.

NORTH, FRANCIS, *Lord GUILFORD*, in *Biography*, lord keeper of the great seal in the reign of Charles II. and James II., was the third son of the second Dudley lord North, baron of Kertling, vulgò Catlage, &c. From Bury school, where he made great proficiency in grammar learning, he was removed to St. John's college in Cambridge, and admitted a fellow-commoner in 1653. Here he acquired great reputation by his assiduity and attainments, and recommended himself to the esteem of his associates by the sprightliness of his conversation. From the university he removed to the Middle Temple, and prosecuted various studies with singular diligence; so that he not only gained the knowledge of the French, Italian, Spanish, and Dutch languages, but became a good lawyer, and a proficient in history, mathematics, philosophy, and music. By the variety of his studies, and particularly by the practice of music, he was relieved in his other pursuits. Availing himself of the friendship and instructions of sir Jeffery Palmer, attorney-general, and the Hudes, he became eminent in his profession; and in the Norfolk circuit, which he usually attended, he was employed as counsel in every important cause. Tired of the routine of his profession, after having been both solicitor and attorney-general, he aspired to the post of lord chief justice of the common pleas, and at length succeeded to his wishes in obtaining it. Upon the death of the chancellor Nottingham, the great seal was committed to his custody, and he was advanced to the peerage with the title of lord Guilford, by letters patent bearing date September 27th, 1683. The number of his avocations, and the unpleasantness of some of his connections after the death of king Charles, induced him to request the king's leave to quit the seal. Not succeeding in his application, he sought temporary relief by retirement into the country; but he died at his house in Wroton, in 1685. Although his private character was strictly virtuous and unexceptionable, he is charged with having been too much influenced by the court, so as even to endanger the Protestant religion in this kingdom. His relation and advocate, Roger North, has endeavoured to vindicate him from all reproaches of his public character, in his "Examen," and in his "Life of the Lord Keeper Guilford."

Philosophy and science, during the 17th century, seem to have interested themselves, and lent their aid in the refinement and melioration of musical sound, more than at any other period. Sir Francis Bacon, Kepler, Galileo, Merfennus, Des Cartes, Kircher, and, after the establishment of the Royal Society in London, lord keeper North, lord Brouncker, Narcissus, bishop of Ferns, Dr. Wallis, Dr. Holder, and sir Isaac Newton, have all thought harmony, and the philosophy of sound, objects worthy of their most profound meditations and researches. The lord keeper used to say, that if he had not diverted his attention by the study of modern languages and the fine arts, and by the practice of music particularly, he should never have been a lawyer.

He published, in 1677, "A philosophical Essay of Music, directed to a Friend." Though some of the philosophy of this essay has been since found to be false, and the rest has been more clearly illustrated and explained, yet, considering the small progress which had been made in so obscure and subtil a subject as the propagation of sound, when this book was written, the experiments and conjectures must be allowed to have considerable merit. The *scheme*, or table of

pulses, at the beginning, shewing the coincidence of vibrations in musical concords, is new, and conveys a clear idea to the eye, of what the ratio of sounds, in numbers, only communicates to the intellect. These coincidences, upon which the degrees of perfection in concords depend, being too rapid for the sense of hearing to enable us to count, are here delineated in such a manner, as explains the doctrine of vibrations even to a person that is deaf. This pamphlet, containing only 35 pages, was published without the name of the author; but afterwards acknowledged to have been the work of lord keeper North, in the life of that nobleman, written by his brother, the honourable Roger North. His delineation of the harmonical vibration of strings seems to have been adopted by Euler, in his "Tentamen novæ Theoriæ musicæ." The keeper is said, in the Biographical Dictionary, to have composed several concertos in two and three parts. Now no composition, in fewer than four or five parts, is ever honoured with the title of concerto; nor was this title given to instrumental music during the life of lord keeper North, who died in 1685. The concertos of Corelli, Torelli, and Alessandro Scarlatti, in seven and eight parts, the first of the kind, were not published till the beginning of the last century. Fancies in two and three parts, indeed, were, we believe, sometimes called *concertos*. And when it is asserted, in the same dictionary, that lord keeper North may be esteemed the father of musical philosophy, it should have been added, in this country; for Galileo in Italy, and Merfennus in France, had deeply investigated the subject of harmonics many years before the publication of the lord keeper North's ingenious essay.

NORTH, The Hon. ROGER, brother of the preceding, was likewise brought up to the law, and was attorney-general to James II. He published an "Examen into the Credit and Veracity of a pretended complete History," viz. Dr. White Kennet's History of England, and also the lives of his three brothers, the lord keeper Guildford, sir Dudley North, and the Rev. Dr. John North. In these pieces there is much curious and truly valuable information, but not without considerable partiality.

The Hon. Roger North was adilettante musician of considerable taste and knowledge in the art, and who watched and recorded its progress during the latter end of the 17th, and beginning of the 18th century, with judgment and discrimination; leaving behind him, at his decease in 1733, a manuscript, entitled "Memoirs of Music," to which being favoured with access, we found it of great use in the history of English secular music, during the period to which his memoirs are confined. See **JENKINS**, and **NICOLA MATTEIS**.

This honourable cultivator and patron of music lived chiefly at Rougham, in Norfolk, where his life was extended to the age of 83. He had an organ, built by father Smith, for a gallery of 60 feet long, which he erected on purpose for its reception. There was not a metal pipe in this instrument, which we saw and heard in the year 1752, yet its tone was as brilliant, and infinitely more sweet, than if the pipes had been all of metal.

NORTH, DUDLEY, Lord, the third baron of that family, was reckoned one of the finest gentlemen in the court of king James, but in supporting that character he dissipated away the greater part of his fortune. In 1645 he appears to have acted with the parliament, and was nominated by them to be administrator of the admiralty, in conjunction with the great earls of Northumberland, Essex, and Warwick. He died at the age of 85. The latter part of his life he passed in retirement, and wrote a small folio of miscellanies, in prose and verse, under the title of "A Forest promiscuous

promiscuous of several Seasons' Productions," in four parts, 1659.

NORTH, DUDLEY, Lord, son of the former, was made knight of the Bath in 1616, at the creation of Charles prince of Wales. He sat in many parliaments, till excluded by the prevailing party in that which condemned the king. From this period lord North lived privately in the country, and towards the end of his life entertained himself with books. He was author of a small tract, entitled "Observations and Advices Economical," 12mo. He wrote likewise "Passages relating to the Long Parliament;" "The History of the Life of Lord Edward North," the first baron of the family, addressed to his eldest son; and a "Volume of Essays."

NORTH, The Hon. JOHN, the fourth brother of the family, was born in 1645. He studied at Jesus college, Cambridge, and entered into holy orders. He was a man of very extensive learning, and was appointed Greek professor in the university of Cambridge. While in that situation, he published some select dialogues of Plato in 1673. He was clerk of the closet to the king, a prebendary of Westminster, and in 1677 succeeded Dr. Barrow in the mastership of Trinity college, Cambridge. He died in 1683.

NORTH, FREDERICK, earl of Guilford, chiefly known as lord North, under which title he was for many years the premier of England. His lordship was born April 13th, 1732, but did not succeed to the earldom and estates till the year 1790. As a minister, he succeeded the celebrated Mr. Charles Townsend as manager of the house of commons (we could, we think, give the office a more appropriate title than is conveyed by the term *manager*) and chancellor of the exchequer; and in 1770, on the resignation of the duke of Grafton, he was made first lord of the treasury; in which office he continued till the close of the American war, or rather till the formation of the Rockingham ministry, by which he and his party, who had desolated the empire by a long and bloody war, and by the loss of the American colonies, were removed. After this he formed a coalition with Mr. Fox, which was esteemed, by the public, as one of the most unnatural junctions ever entered into by political characters. It excited an almost universal abhorrence, and of course did not last long. Lord North, in 1790, succeeded his father as earl of Guilford, and died August the 5th, 1792. He was a man of strong mental abilities; and either by his eloquence, or by still more attractive means, he commanded attention and enforced conviction. His lordship was one of the loudest advocates of what during the present reign has been denominated the Constitution in church and state. No man was ever more beloved in private life, but as a public character his memory cannot be respected by those who are friends to the peace, the liberties, and the happiness of their country and of the human race.

NORTH, in *Cosmography*, one of the four cardinal points of the horizon being that intersection of the horizon and meridian which is nearest our pole.

NORTH Bay, in *Geography*, a bay of the East India sea, on the S. coast of Chiampa. N. lat. $10^{\circ} 36'$. E. long. $106^{\circ} 35'$.

NORTH Cape, a cape on the N. coast of Ireland. N. lat. $55^{\circ} 15'$. W. long. $8^{\circ} 55'$.—Also, the most northerly point of Europe, on the coast of Norway. N. lat. $71^{\circ} 10'$. E. long. 26° .—Also, a cape on the coast of Asia, in the Frozen ocean. N. lat. $68^{\circ} 56'$. W. long. $179^{\circ} 9'$.—Also, a cape on the E. coast of South America, forming the N. boundary of Brazil. N. lat. $1^{\circ} 48'$. W. long. $56^{\circ} 6'$.—Also, the N. part of the island of St. John, in the gulf of St. Law-

rence. N. lat. 47° . W. long. $63^{\circ} 55'$.—Also, the N.E. point of the island of Cape Breton. N. lat. $47^{\circ} 2'$. W. long. $60^{\circ} 12'$.—Also, a cape of Africa, on the W. coast of Morocco. N. lat. $32^{\circ} 45'$.—Also, the northern extremity of New Zealand, which forms the N. point of Sandy bay, and is a peninsula jutting out N.E. about two miles, and terminating in a bluff head that is flat at the top. The land of this cape has the appearance of an island; upon it Cook saw in 1769 a hippah or village, and a few inhabitants; and on the S.E. side of it there appeared to be anchorage and a good shelter from the S.W. and N.W. winds.—Also, the N.E. point of the island of Fernando Po. N. lat. $3^{\circ} 50'$. E. long. $7^{\circ} 55'$.

NORTH, Department of the, one of the twelve departments of the second or northern region of France, composed of French Flanders, &c., bounded on the N. by the sea, on the N.E. by Flanders and Austrian Hainaut, on the S. by the department of the Aisne, and on the W. by that of the straits of Calais, in $50^{\circ} 20'$ N. lat. 44 Fr. leagues in length and 10 in breadth, and containing 6030 kilometres or 278 square leagues, and 774,450 inhabitants. It is divided into 6 circles or districts, 60 cantons, and 671 communes. The circles are Bergues, including 80,242 inhabitants, Hazebrouch, 106,241, Lille, 221,228, Cambray, 108,551, Avesnes, 91,746, and Douay, 166,442. According to Hassenfratz, the number of circles is 8, of cantons 59, and of inhabitants 447,910. The capital of this department is Douay. Its annual contributions in the eleventh year of the French era amounted to 6,736,621 fr. and its expences to 514,603 fr. 87 cents. The soil of Hazebrouch is marshy; but the other districts are fertile, yielding abundance of grain, fruits, and pastures. Hazebrouch contains the forest of Nieppe, and in Douay are the mineral springs of St. Amand.

NORTH Coasts, Department of, one of the nine departments of the N.W. region of France, formerly Upper Bretagne, a maritime territory between Finisterre and Ille, in $48^{\circ} 30'$ N. lat., bounded on the N. by the English channel, on the E. by the department of Ille and Vilaine, on the S. by the department of the Morbihan, and on the W. by that of Finisterre, 30 Fr. leagues in length, 15 in breadth, containing $567\frac{1}{2}$ kilometres or 353 square leagues, and 499,927 inhabitants. It is divided into 5 circles, 47 cantons, and 376 communes. The circles are Lannion, including 83,633 inhabitants, St. Briec, 145,176, Dinan, 96,327, Loudeac, 85,271, and Guingamp, 89,520. The capital is St. Briec. According to Hassenfratz, the number of circles is 9, of cantons 81, and of inhabitants 523,860. The contributions in the year 11 amounted to 2,549,791 fr. and the expences to 306,687 fr. 19 cents. The cultivated tracts in this department yield abundance of grain, wine, flax, fruits, and pastures. It has iron and lead mines.

NORTH Company. See COMPANY.

NORTH Dial. See DIAL.

NORTH-East, a rhumb, or point, in the middle between the east and north.

NORTH-East Land, in *Geography*, an island in the North sea, of a triangular form, about 200 miles in circuit, separated from Spitzbergen by a channel, called Hinlopen straits. N. lat. $79^{\circ} 15'$ to $80^{\circ} 18'$. E. long. 18° to $23^{\circ} 30'$.

NORTH-East Passage. The advocates for the north-east passage, says a late writer, have divided that navigation into three parts; and by endeavouring to shew that these three parts have been passed at different times, they conclude from thence, that the whole taken collectively is practicable. These three parts are, 1. From Archangel to the river Lena.

2. From

2. From the Lena round Tschukotskoi Nofs, (or the north-eastern promontory of Asia) to Kamtschatka: and 3. From Kamtschatka to Japan. With respect to the first part, no one ever asserted that it has been performed in one voyage; from an account of the several voyages that have been made in these seas it appears, that there is a cape between the rivers Chatanja and Piasida, that has never yet been doubled. As to the second division of the north-east passage, it has been affirmed, that a passage has been effected by several vessels, which have, at different times, sailed round the northern extremity of Asia. But from the Russian accounts it is inferred, that it has been performed but once, viz. by oné Deshneff, who, in 1648, is said to have doubled this formidable cape. Of the third, or remaining part of this passage, no doubt can be entertained. The connection between the seas of Kamtschatka and Japan has been established by many voyages. Coxe's Account of the Russian Discoveries, &c. 4to. 1780. See *NORTH-WEST Passage*.

NORTH-East Point, in *Geography*, a cape on the island of Jamaica. N. lat. $18^{\circ} 11'$. W. long. $76^{\circ} 2'$.

NORTH Foreland. See *FORELAND*.

NORTH Haven Point, a cape on the S. coast of England, at the entrance of Pool bay; eight miles E. of Pool.

NORTH Head, a cape on the N.E. coast of New Holland, and N.W. point of Bustard bay. S. lat. 24° .—Also, one of the smaller Orkney islands. N. lat. $58^{\circ} 38'$. W. long. $2^{\circ} 55'$.

NORTH Island, a small island in the East Indian sea, near the W. coast of Borneo. S. lat. $1^{\circ} 22'$. E. long. $109^{\circ} 5'$.—Also, a small island near the S. coast of Celebes. S. lat. $5^{\circ} 38'$. E. long. $120^{\circ} 48'$.—Also, a small island near the S.W. coast of the island of Boutan. S. lat. $5^{\circ} 33'$. E. long. $122^{\circ} 50'$.—Also, a small island in the North Pacific ocean, in Dixon's entrance. N. lat. $54^{\circ} 20'$. W. long. $133^{\circ} 10'$.—Also, an island in the Atlantic, near the coast of America, at the mouth of the Great Pedee river, near the coast of South Carolina. N. lat. $33^{\circ} 20'$. W. long. $79^{\circ} 3'$.—Also, a small island in the Pacific ocean, discovered by captain King in 1779. N. lat. $25^{\circ} 14'$. E. long. $141^{\circ} 10'$.—Also, a small island in the East Indian sea. S. lat. $5^{\circ} 38'$. E. long. $105^{\circ} 43'$.

NORTH Key, a small island in the bay of Honduras. N. lat. $17^{\circ} 24'$. W. long. $87^{\circ} 57'$.

NORTH Mountains, a ridge which branches off from the Alleghany mountains, S. of James' river, extending into Maryland, as far as the river Potowmack.

NORTH-North-east, *North-east-and-by-east*, are subdivisions of the compass between the north and east. See *WIND*.

NORTH Point, in *Geography*, a cape of England, on the coast of Durham. N. lat. $55^{\circ} 4'$. W. long. $1^{\circ} 2'$.—Also, a cape on the N. coast of the island of Morty. N. lat. $2^{\circ} 45'$. E. long. $128^{\circ} 20'$.

NORTH Pole. See *POLE*.

NORTH Reef, a reef of the island of Hispaniola. N. lat. 33° . W. long. $69^{\circ} 12'$.

NORTH River, a river of the island of St. Vincent, which runs into the sea, one mile N. of Young Point.—Also, a river of Canada, which runs into the Utwas; 129 miles W. of Montreal.—Also, a river of North Carolina, which runs into Albemarle sound. N. lat. $36^{\circ} 6'$. W. long. $76^{\circ} 10'$.—Also, a river of Massachusetts, which runs into the sea between Scituate and Marble head.—Also, a branch of Hudson's river.—Also, a branch of Fluviana river, in Virginia.

NORTH Sea. See *SEA*.

NORTH Sound Point, a cape of the island of Antigua, at the E. side of the entrance into Parham harbour. N. lat. $17^{\circ} 16'$. W. long. $61^{\circ} 27'$.

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NORTH Star, the last in the tail of the Little Bear; called also the *pole-star*; which see.

NORTH Wales, in *Geography*. See *WALES*.

NORTH Wales, a town of Caroline county, Virginia; 10 miles N.W. of Hanover.

NORTH Wall. See *WALL*.

NORTH-West, is a point or rhumb, in the middle between the north and west. See *WEST*, &c.

NORTH-West Bay, in *Geography*, a bay on the N. coast of the island of Fernando Po. N. lat. $5^{\circ} 35'$. E. long. $7^{\circ} 35'$.

NORTH-West Company. See *COMPANY* and *FUR Trade*.

NORTH-West Passage. Much difference of opinion has subsisted as to the navigable extremities of our own hemisphere; particularly as to the existence, or at least, as to the practicability of a northern passage between the Atlantic and Pacific oceans, either by sailing *eastward*, round Asia, or *westward*, round North America. If such a passage could be effected, it is obvious that voyages to Japan and China, and indeed to the East Indies in general, would be much shortened, and consequently become more profitable, than by making the tedious circuit of the Cape of Good Hope. To this object the English, in common with other nations, have directed their attention for more than two centuries. We shall now say nothing of Cabot's original attempt in 1497, which terminated in the discovery of Newfoundland and the Labrador coast; but observe, that from Frobiisher's first voyage to find a western passage, in 1576, to those of James and Fox, in 1630, repeated trials have been made by enterprising adventurers. In the course of these voyages, our knowledge of the northern extent of America was enlarged by the discovery of Hudson's and Baffin's bays; and yet the wished-for passage on that side, into the Pacific ocean, was still unattained. Both our countrymen and the Dutch were equally unsuccessful, in various attempts to find this passage in an eastern direction. Wood's failure, in 1676, seems to have closed the long list of unfortunate northern expeditions in that century; and the discovery, if not absolutely despaired of, by having so often failed, ceased for many years to be an object of investigation. Mr. Dobbs, a warm advocate for the probability of a north-west passage through Hudson's Bay, in our own times, once more recalled the attention of this country to that undertaking; and by his active zeal, and persevering solicitude, renewed the spirit of discovery; but it was renewed in vain. For Capt. Middleton, sent out by government in 1741, and captains Smith and Moore, by a private society in 1746, though encouraged by an act of parliament passed in the preceding year, that annexed a reward of 20,000*l.* to the discovery of a passage, returned from Hudson's Bay with reports of their proceedings, that left the accomplishment of this favourite object at as great a distance as ever. The object, however, was not abandoned, and captain Cook was selected for undertaking a voyage in the prosecution of it. In the project with which he was intrusted, the usual plan of discovery was reversed; and instead of a passage from the Atlantic to the Pacific ocean, one from the latter into the former was to be attempted. Accordingly, Capt. Cook was ordered to proceed into the Pacific ocean, and to make his progress northward to the principal scene of his operations. The commissioners of the admiralty drew up instructions for his conduct of the voyage, which were signed by them on the 6th of July, 1776, and subsequently delivered to captain Cook. In order to encourage adventurers in the pursuit of this object, an alteration had been made in the act of parliament, passed in 1745, (18 Geo. II. c. 17). which held out a reward of 20,000*l.* merely to ships belonging to any of his majesty's subjects, exclusive of his majesty's

own ships, and which held out this reward only to such ships as should discover a passage through Hudson's Bay. In this new statute, (16 Geo. III. c. 6.) it was enacted, that if any ship belonging to any of his majesty's subjects, or to his majesty, should find out, and sail through, any passage by sea, between the Atlantic and Pacific oceans, in any direction or parallel of the northern hemisphere, to the northward of the 52° of northern latitude, the owners of such ships, if belonging to any of his majesty's subjects, or the commander, officers, and seamen, of such ship belonging to his majesty, shall receive, as a reward for such discovery, the sum of 20,000*l*. It was also enacted, with a view to the discovery of a communication between the Atlantic and Pacific oceans, that if any ship shall approach to within one degree of the north pole, the owner, &c. or commander, &c. so approaching, shall receive, as a reward for such first approach, the sum of 5000*l*. In order to facilitate the success of Capt. Cook's expedition, lieutenant Pickersgill in 1776, and lieutenant Young in 1777, were ordered to proceed to Baffin's bay, to explore its western parts, &c. The execution of these preconceived voyages did not answer the expectations that were formed of them, for reasons which it is here needless to detail. The instructions committed to Capt. Cook were founded on an accurate knowledge of what had been already done, and of what still remained to be performed; and this knowledge pointed out the inutility of beginning his search for a passage till his arrival in the latitude of 65°, whither he was directed to repair. The Hudson's Bay company, though for some time tardy in the contrivance and execution of plans and voyages towards the discovery of a N.W. passage, at length exerted themselves by land-journeys as well as by sea-voyages for the accomplishment of this great object; but altogether without success. Capt. Cook and Capt. Clerke have made such discoveries on the west side of America, and have given such a report of Beering's strait, as will serve, in addition to those of Mr. Hearne by land, and of other navigators, to discourage future attempts to penetrate into the Pacific ocean, in any northern direction. Phil. Transf. N° 482, sect. 14. Introduction to Cook's Third Voyage, vol. i.

NORTH-West Point, in *Geography*, a cape on the west coast of Africa. S. lat. 16° 36'.

NORTH-West River, a branch of Cape Fear river, in North Carolina.

NORTH-West Territory, a part of the United States of America, divided into the states of Ohio, Indiana, and the county of Wayne.

NORTH Wind. See **WIND**.

NORTHADSTEDE, in *Geography*, a town of the duchy of Holstein; eight miles N.E. of Meldorp.

NORTHALBEN, or **NORDHEIM**. See **NORDHAELEN**.

NORTHALLERTON, a borough and market-town in the wapentake of Allertonshire, North Riding of the county of York, England, is situated on the side of a rising ground, gently sloping towards the east, 31 miles distant from the city of York, and 225 miles from London. Near this place, in the year 1138, the memorable battle of the Standard was fought between the English and Scots. David, king of Scotland, taking advantage of the civil war between king Stephen and the empress Matilda, ravaged the northern parts of England, and advanced as far as this town, where he was opposed by an army under the command of the earls of Albemarle and Ferrers. To animate the English forces, the bishop of the Orkneys, acting as deputy to Thurstan, archbishop of York, who was confined by sickness, brought from the convent of Beverley a consecrated standard, which was a tall mast, fixed in a four-wheel carriage, and hav-

ing at the top a pix with the host, and a cross with the banners of St. Peter and St. John of Beverley: from this circumstance the battle acquired its name. The Scots, relying on their superior force, rushed to the attack, but were totally routed, with the loss of 10,000 men, and were glad to return to their own country, with the shattered remains of their army. The spot on which the conflict took place, is still called Standard-hill.

The town consists principally of one street, the houses of which are built with brick: the market-place is spacious, and surrounded with very good houses. The church is an ancient structure, built in the form of a cross, and contains several monuments. The civil government of the town is vested in a bailiff, who holds his office for life, by the appointment of the bishop of Durham for the time being. To this see the whole of the manor has been subject ever since the time of William Rufus. Two members are returned to the imperial parliament from this borough: the right of election is in the whole body of householders paying scot and lot. A market is held on Wednesdays, and here are five annual fairs, in which horses and horned cattle constitute the chief articles of traffic. In the parliamentary survey of the year 1811, Northallerton was stated to contain 2234 inhabitants, occupying 510 houses. Near this town an hospital, dedicated to St. James, was founded by Hugh Pufar, bishop of Durham, about the close of the twelfth century: it was granted at the dissolution to sir Richard Morysine, and afterwards became part of the endowment of Christchurch college, Oxford. A similar establishment, founded by Richard de Moore in the year 1476, is yet in being; but part of its possessions having been alienated, only four persons are maintained in it, who are nominated by the earl of Carlisle, the patron. Beauties of England and Wales; Yorkshire, vol. xvi. by J. Bigland.

NORTH AMERICA comprehends all that part of the continent of America which lies N. of the isthmus of Darien, extending N. and S. from about the 10th deg. of N. lat. to the north pole; and E. and W. from the Atlantic to the Pacific ocean, between the 57th and 168th deg. of W. long. from Greenwich. Beyond the 70th degree N. lat. few discoveries have been made. North America was discovered in 1497, in the reign of Henry VII. by John Cabot, a Venetian; and was then thickly inhabited by Indians. It is now supposed that there are not more than two millions and a half of the aborigines in N. and S. America. Of North America an account has been already given under **AMERICA**; but we shall here subjoin some further particulars, correcting the details that occur more largely under that article, and adding others that have not been already introduced. The provinces and states comprehended under North America, are here exhibited under the following more enlarged and correct **TABLE**.

Belong to	Countries, Provinces, and States.		Number of Inhabitants.
Denmark.	West Greenland,	about	10,000
British Provinces.	New Britain		unknown
	Upper Canada	about	80,000
	Lower Canada	—	150,000
	Newfoundland	—	7,000
	Cape Breton Island	—	1,000
	New Brunswick	} —	35,000
	Nova Scotia		
	St. John's Island		
	in 1783,	5,000	
		Vermont	

NORTH AMERICA.

Belong to	Countries, Provinces, and States.	Number of Inhabitants.
United States of America.	Vermont	154,465
	New Hampshire	183,858
	Massachusetts	422,845
	District of Maine	151,719
	Rhode Island	69,122
	Connecticut	257,002
	New York	586,050
	New Jersey	211,149
	Pennsylvania	602,545
	Delaware	64,273
	Maryland	349,692
	Virginia	886,149
	Kentucky	220,929
	North Carolina	478,103
	South Carolina	345,959
	Georgia	162,686
	Tennessee	105,602
	Ohio	42,159
	Wayne county, a distinct government	3,206
	Indiana territory, N.W. of Ohio river	6,407
	Mississippi territory	8,840
	Louisiana, lately purchased by the United States.	See LOUISIANA.
Span. Prov.	East Florida	unknown
	West Florida	—
	New Mexico	—
	California	—
	Mexico, or New Spain	—

See an account of each of the above-mentioned provinces and states under their appropriate titles.

In July 1779, Capt. Cook, and since his voyage Capt. Vancouver and many others, have explored and described the western coast of North America. The former proceeded as far as N. lat. 71°, when he came to a solid body of ice from continent to continent. Of the discoveries of both these navigators, and also of Perouse, &c. see an account under CALIFORNIA, NEW ALBION, FRANÇOIS, NOOTKA, and NORTH-*West Passage*. The interior country has been explored by Messrs. Hearne and Mackenzie. The former went northward to the Frozen ocean, at the mouth of Cop-permine river. The latter embarked at fort Chepewyan on the S. of the Lake of the Hills, in N. lat. 58° 40'. W. long. 110° 30', in June 1789, in a canoe of birch bark, with ten associates, three of whom were in another canoe. His course was north-westerly to seek the Frozen ocean. Mountains and vallies, dreary wastes and wide spreading forests, lakes and rivers, succeed each other in his descriptions. Very small bands of wandering savages were the only people he discovered. After leaving the Lake of the Hills, he entered the Slave river, from which he passed to the Slave lake, a large body of fresh water, in about N. lat. 61° and 62°, and W. long. 110° to 120°. The country round wears a barren aspect, but produces a great variety of berries, and is covered with large trees of spruce-pine and white birch. Where these are destroyed, poplars succeed, though none were seen before. From this lake he entered Mackenzie's river, a deep and spacious stream. On its banks he found encampments of Knisteneaux Indians. This wandering tribe spreads over a vast extent of country. Their language is the same as that of the natives on the waters of the St. Lawrence and the coast of Labrador. They are of a moderate stature, well proportioned and active. Their dress is simple, countenance open, and eyes black. Their women are the most

comely of savages, and not inattentive to their own persons, but still pay more attention to the decoration of the men. These people are affable, indulgent to their children, and hospitable to strangers. Chastity they consider not as a virtue; they make temporary exchanges of wives, and a proffer of them to strangers is a part of their hospitality; incest and bestiality are not uncommon. At their funerals the mourners cut off their hair, lacerate their flesh, blacken their faces; and widows, as in the east, sometimes sacrifice themselves. Smoking precedes all matters of importance. This sacred rite settles all differences between contending persons; it is never violated. No person may join in this solemn act, who has cohabited with a woman within 24 hours—he “is unclean.”

After proceeding down this river to N. lat. 69° 1', and about W. long. 134°, he reached the tide waters of the Frozen ocean; but in the middle of July was forbidden to proceed any further by extensive fields of ice, and returned to Chepewyan fort, having been absent 102 days. In October 1792, he proceeded on a voyage to the N. Pacific ocean. From the Lake of the Hills he ascended the Peace river, which in the driest season is a quarter of a mile in breadth; the soil on each side is low and rich. Like other unchristianized people, the Indians on this river practise polygamy. The women are in the lowest state of debasement; more indecent and filthy than the men. The females perform all the drudgery allotted to brutes in civilized society, excepting what aid they receive from a few small dogs. While the men carry nothing but a gun, their wives and daughters follow with such oppressive burdens, that if they lay them down they are unable to raise them again. This help the men will not deign to lend them; they often, therefore, lean against a tree for a partial, temporary relief. These people are total strangers to the most simple remedies in time of sickness. At their funerals, among other extravagant tokens of grief, the females, for the death of a favourite son, or husband, or father, sometimes cut off a finger at the first joint. Some of the old women have not a whole finger on either hand. The property of the person deceased is all destroyed, that the sight of things connected with him may not renew their grief. These savages are great gamblers, pursuing the business sometimes for a succession of days and nights.

In the mountains which separate the waters of the Atlantic and Pacific oceans, are several chafms, which emit smoke and fire with a sulphureous smell. Finding the streams of the west did not tend directly to the sea, Mr. Mackenzie proceeded by land for a considerable time, finding in general a tolerable road or path made by the savages. As he advanced nearer the ocean, the settlements of the natives were more numerous and permanent; the manner of living more comfortable, the state of society somewhat improved: men took a share in domestic labours, and women were more respected. Architecture was improved; painting and carving had made some progress. The timber of a house was seen hewn on two sides; the end of the ridge-pole was carved in the form of a snake's head; the insides of several buildings were decorated with painted hieroglyphics. In some of their villages are temples supported by pillars, carved in the shape of men. These are painted black and red. Their waters are stored with salmon, and they hospitably invite the stranger to share in their plenty; a variety of berries enrich the feast. Copper, iron, and brass are frequently seen near the sea, which the natives had purchased of European ships. The soil is good; alder trees are 7½ feet in circumference, and 40 feet without a branch; cedars are 24 feet in circumference and proportionably high. Wil-

lows, spruce, birch, and hemlock are common. Their canoes of cedar carry 50 persons. In some instances, when a person dies he is buried till another of the family shall de- cease, then he is taken up and burned, and the other person laid in the same grave. They believe in a good and evil spirit, and have seasons for public and private worship. In N. lat. 52° 21' 33", and W. long. 128° 2', Mr. Mackenzie reached the Great Pacific ocean, and with vermilion inscribed on the side of a rock by the shore—

"Alexander Mackenzie, from Canada by land, the twenty-second of July, one thousand seven hundred and ninety-three."

NORTHAMPTON, the principal and county-town of Northamptonshire, England, is memorable in the annals of political and local history for the number of councils and synods held there; for its formidable ancient castle, with the provincial earls; also for numerous monastic foundations, and military events; and lastly, for its modern improvements and pleasantness of situation, as a place of business or retirement. It may be said to be divided into four almost equal parts, by two streets running east and west, and north and south. Both these streets are wide and commodious, and each extends nearly a mile in length. Most of the houses are built of a reddish-coloured sand-stone, dug from quarries in the neighbourhood; but some are constructed with stone of a yellowish tint, and a few are brick buildings. At the eastern extremity of the town a pleasant walk has been made, which is called Vigo Paradise Walk, or the New Walk, and was formed at the expence of the corporation. At the lower extremity of it is a spring of chalybeate water, and near the upper end is another spring of clear water, known by the name of Thomas à Becket's Well. On the north side of the town is a tract of land, which, in the year 1778, was an open field of 894 acres; but in that year an act of parliament for enclosing it was obtained. About 129 acres of this were then allotted to the freemen of the town, for cattle, &c.: but it was provided in the act that the same may be claimed and used as a race-course for any two days between the 20th of July and the 20th of October.

Ancient History.—It is stated that a town was formed at this place during the Anglo-Saxon dynasty, and that the same was attacked, plundered, and burnt by the Danes, in their different predatory incursions into this part of the island. The Northumbrians, under earl Morcar, took possession of this town in the year 1064; and in the genuine spirit of savage warriors, murdered many of the inhabitants, burnt the houses, and carried away multitudes of cattle and prisoners. According to records there were then sixty burgesses in the king's lordship, and sixty houses; but at the era of the Norman conquest fourteen of the latter were waste. By the Domesday Survey, it appears that there were then only forty burgesses in North-hampton. "William the Conqueror gave to Simon St. Liz, a noble Norman, the town of Northampton, and the whole hundred of Fawkely (Fawley), then valued at forty pounds *per annum*, to provide shoes for his horses." In 1106, the Saxon Chronicle states, that Robert, duke of Normandy, had here an interview with his brother, king Henry I., to compromise the differences then subsisting between them. In his twenty-third year, that monarch and his court kept the festival of Easter at Northampton, with all the pomp and state peculiar to that age; and in the thirty-first year of the same reign a parliament was held in this town, when the nobles swore fealty to the empress Maud, on whom the king had settled the right of succession. In 1138, king Stephen, in order to attach the clergy to his interest, a measure in those days

essentially necessary, summoned a council to meet him at Northampton, when all the bishops, abbots, and barons of the realm attended, for the purpose of making promotions in the church. In 1144, Stephen held his court here, when Ranulf, earl of Chester, who came to tender his services, was detained as a prisoner till he had surrendered the castle of Lincoln, and other fortresses, as security for his allegiance, he being suspected of conspiring with the duke of Normandy against the king. When the celebrated statutes of Clarendon were established (10 Hen. II.) for the good order of the kingdom, and for the better defining the boundaries of ecclesiastical jurisdiction; and archbishop Becket alone refused his assent (a refusal attended with a train of evils, vexatious to the king and fatal to the prelate), a council of the states was convened at Northampton, before which the archbishop was summoned to appear, and answer to the charges of contumacy, perjury, &c. which should then be exhibited against him. In the 20th year of this reign, Anketil Mallore, who supported prince Henry's unnatural rebellion, marched with a considerable force from Leicester to Northampton; where, having defeated the Royalists, he plundered the town, and returned to Leicester with his booty, accompanied by nearly 200 prisoners. In the 26th year of this monarch's reign, a convention of the barons and prelates was assembled here to amend, confirm, and enforce the constitutions of Clarendon. By this council the kingdom was divided into six circuits; and justices itinerant were assigned to each. From the formation of this convention, the advice of the knights and burgesses being required, as well as that of the nobles and prelates, it has been considered as the model by which parliaments have been constituted in succeeding times. The king of Scotland, with the bishops and abbots of that kingdom, attended this council to profess their subjection to the church of England. In the 10th of Richard I., Geoffrey Fitzwalter paid 40s. to be discharged from the inspection of the coinage here: this is the first official mention of a mint at Northampton, though there are reasons to believe it of greater antiquity. How long it subsisted is uncertain, but mention is made of it in the two succeeding reigns. On the death of king Richard, John, his successor, being then in Normandy, a great council of nobles assembled in this town, and were prevailed on by the adherents of the new monarch to take an oath of fealty to him, and support his claim to the crown. King John, in the 10th year of his reign, having been displeased with the citizens of London, commanded the exchequer to be removed to Northampton. In his 13th year, in a council of lay nobles convened here, the king met the pope's nuncios, Pandulph and Durand, in order to adjust those differences which had long subsisted between him and the holy see. The king made large concessions; but as he would not, or could not, restore to the clergy their confiscated effects, the treaty was broken off, and the king was solemnly excommunicated by the legates. During the reign of Henry III. Northampton was frequently honoured with his residence, and with particular marks of his favour: and in the wars between that king and the confederate barons, it was alternately besieged and possessed by each of the contending parties. About this time a kind of university was established here, consisting of students, who at different times, and from various causes, had deserted Oxford. The new seminary at first was countenanced by the king; but the scholars, having taken a decided part in favour of the barons, were commanded to return to Oxford. A similar emigration took place from the university of Cambridge; but was soon superseded by a royal mandate, which compelled the students to return to their old seminaries; and further provided

provided that no university should ever be established here. It is, however, a manifest indication of the importance attached to Northampton, that both the universities should make choice of this place as their asylum and abode.

On Good Friday, in the seventh year of Edward I., the Jews residing in this town attempted to crucify a Christian boy, who fortunately survived their cruelty: for this atrocious act fifty of them were drawn at horses' tails, and publicly hanged. In the preceding year fifty had been hanged for clipping the coin. These, and other enormities, rendered the Jews so odious, that in the 18th year of this reign a statute was passed for their total expulsion from the kingdom, and for the confiscation of their property. Edward I. frequently resided at Northampton in great splendour; and on his death a parliament was held here to settle the ceremonial of his burial, and the marriage and coronation of his successor. Another parliament met here in 1317, in which an impostor, John Poydras, son of a tanner at Exeter, was brought to trial for affirming that he was the real son of Edward I., and that the king was a carter's son, and substituted at nurse in his stead: producing no evidence, however, in support of his assertions, he was condemned and executed. In the 11th year of Edward III., the mayor, bailiffs, and burgesses of Northampton, obtained the royal licence to hold an annual fair for twenty-eight days; which fair is now discontinued. In this reign several parliaments were held here. The last parliament that assembled at Northampton was 4 Richard II., when the poll-tax was levied, which caused a rebellion, wherein Walter Tyler was the chief. The next memorable event respecting this town, was a decisive battle fought in its vicinity between the Yorkists and Lancastrians (38 Henry VI.), when that unfortunate monarch was made prisoner. Northampton was visited by queen Elizabeth in 1563, and by king Charles I. in 1634: it was ravaged by the plague in 1637; and in 1642 was seized by the parliamentary forces, by whom it was fortified; the south and west bridges being converted into draw-bridges, and additional works thrown up in the defenceless places. In the north-east part of the town parts of a foss and bastion of earth are yet visible. The town suffered greatly by a flood, May 6th 1663. Northampton has sustained some very severe losses by fire; but these have ultimately proved beneficial to the place, for the uniformity and substantial character of the houses, width of the streets, and general arrangement of the town, are all to be attributed to those calamitous events. According to Leland's statement, most of the houses were made of wood in his time. On Midsummer day, 1566, a fire destroyed several houses: but the most memorable occurrence of this nature was in the year 1675, when the greater part of the town was consumed, and many of the poorer inhabitants reduced to great distress. The general loss of property was estimated at 150,000*l*. Above 600 dwelling-houses were then burnt, and more than 700 families thereby deprived of their habitations and property. A subscription was soon instituted, and it appears, by a list of benefactions, that above 20,000*l*. were raised for the sufferers.

The town of Northampton was formerly surrounded by embattled walls, and was defended by a large fortress, or castle, and by bastion towers. In the walls were four gate-houses, named, from their relative situations, East Gate, West Gate, North Gate, and South Gate. Those towards the south, north, and west, had rooms or dwellings over them, and that to the east, according to Bridges, "was the fairest of all," being lofty, and embellished with shields, arms, and other ornaments. Southward of this was a

smaller gate or postern, called the Durn Gate. By an inquisition taken in the time of Edward I., it appears that the walls were embattled; and at different places had steps to ascend them. Like the walls round the city of Chester, these served for a public walk; where the infirm and indigent inhabitants were accustomed to "take the air." They also constituted the best foot-path in the winter, from one extremity of the town to another. This walk is reported to have been wide enough for six persons to walk abreast. Leland mentions the walls and gates as standing when he visited Northampton. The same topographer says, "The castle standeth hard by the West Gate, and hath a large kepe. The area of the residue is very large, and bullwarked of yeth be made afore the castle-gate." That some fortress was erected at Northampton before the Norman conquest, may be inferred from the events that occurred here during the Saxon and Danish dynasties; but of that building no accounts have descended to the present times. It is, however, recorded, that Simon de Senliz, or St. Liz, the first earl of Northampton of that name, erected a castle here in the reign of William the Conqueror; but as no mention is made of it in the *Domesday Book*, it appears not to have been completed till after that survey was taken. It was situated on an eminence without the West Gate of the town; and was defended on three sides by a deep trench or foss, whilst a branch of the river Nen served as the natural barrier on the western side. In Henry II.'s reign it was possessed by the crown; and was afterwards entrusted to some constable or castellan appointed by the sovereign. But in the civil war of 1264, between Henry III. and his nobles, we find it in the occupation of the confederate barons, under the banner of the earl of Leicester, whose son, Simon de Montfort, was then its governor. The king having received considerable reinforcements from the northern barons, his adherents besieged the castle with great vigour; but its admirable situation and strength, with the undaunted courage of the garrison, composed of the finest troops in the service of the earl, and, under the direction of officers of distinguished skill and valour, baffled all the efforts of the royal troops, and convinced them that force was totally inadequate to their arduous enterprise. At length they had recourse to a stratagem, not altogether just or manly in principle, but which effectually served their purpose. While the barons were engaged in a parley, under pretence of negotiation, a chosen body of the royal forces was dispatched to make a breach in the opposite wall. The plan succeeded: the garrison, thus taken by surprise, were, notwithstanding a brilliant display of courage, completely discomfited, and surrendered themselves prisoners of war: in this capitulation were included fourteen of the most potent barons and knights bannerets, and forty inferior knights. The castle thus reverted to the crown, till, in the 3d year of Edw. III., Thomas Wake, then sheriff, claimed the custody of it as annexed to the county, and belonging to his jurisdiction; and it being found by inquisition, then taken, to have been immemorially attached to that office, it was ordered to be given up to be held by the said sheriff and his successors. Within the castle was a royal free chapel, dedicated to St. George. Previous to the year 1675, this fortress was used as the county gaol; and the two courts of justice were held here. In 1662, pursuant to an order of the king and council, the walls and gates and part of the castle were demolished; and the site of the latter fold soon after to Robert Haselrig, esq. in whose family it still remains. It appears, indeed, from the account of Norden, that even in the year 1593 the castle was much decayed, and the walls defenceless. "This towne," says he, "is a faire towne, with

with many faire old buildings, large streets, and a very ample and faire market-place; it is walled about with a wall of stone, but meane too of strength; neare unto the towne there standeth an eminent castle, ruynous." Since Norden's time, most of these ruins have been swept away or levelled: and now only a few fragments of foundation walls, and parts of the fosses, remain. The inner ballium was nearly circular, and surrounded by a lofty wall with bastion towers at irregular distances. This again was encompassed by a deep and wide foss. A broad ballium, or area for the garrison, extended some distance, and was guarded by an outer vallum with barbican, &c. The general extent and character of the earth-works may still be traced.

Northampton is both a corporate and borough-town; its first charter of corporation appears to have been obtained from king Henry II., but since that reign several other charters, to alter or enlarge the privileges of the corporate body, have been granted. For the first of these, the burgesses gave a fine of 200 marks, to hold the town of the king *in capite*. By a subsequent charter from king John, they were exempted from all "toll, lastage, and murage; also from being impleaded out of the town;" and were invested with other liberties in as ample a manner as the citizens of London. In these privileges they were bound to pay annually into the king's exchequer 120*l*. In the 41st year of Henry III. a new charter was obtained, confirming and extending the liberties, &c. of the burgesses. Again in the 27th of Edward I., and in the 4th of Henry VII., the charter was renewed and confirmed; and in the 9th year of the latter reign, the mayor, bailiffs, &c. obtained the liberty of choosing a recorder, and appointing two burgesses, who, with the mayor, were invested with the powers of justices of peace within the town. By a charter bearing date 3d of August, 15th Charles II., the corporation is specified to consist of a mayor and two bailiffs, and such as have been mayors and bailiffs, with 48 burgesses, called common council, recorder, chamberlain, and town-clerk. Though this charter was surrendered in 1683, and a new one issued, yet the former continued in force till 1796, when an altered, or as it is commonly called, a new charter was obtained.

The recorder and town-clerk usually continue for life, though subject to annual election. This corporation is invested with extensive juridical powers; being qualified to try all criminal causes, though they seldom extend their jurisdiction beyond petty larcenies. For this purpose, therefore, they hold a court of record once in every three weeks. As a borough, Northampton has continued to return two members to the British senate ever since the 12th of Edward I., when it sent two representatives to the parliament held at Aston-Burnel, in Gloucestershire. In the first year of Edward II. the parliament was held at Northampton; and John de Longueville, and Robert de Bedford, were members for this place. Few boroughs have been more noted in the annals of contested election than Northampton, as it is commonly considered an open borough: *i. e.* every inhabitant householder, paying scot and lot, has the liberty of voting. This Mr. Pennant calls "a cruel privilege for such, who have, of late years, been ambitious of recommending their representatives." If cruel to the ambitious, it is certainly important to the humble part of the public, for though corruption, intrigue, and bribery, may seduce a few, these are not so likely to operate on the many. The number of voters is nearly 1000. A memorable election contest for this borough occurred in 1768, when the earls of Halifax, Northampton and Spencer were opposed to each other; or rather each exerted his respective influence to return a mem-

ber. Never perhaps was bribery so extensively and lavishly employed: and though all the parties were not positively ruined, yet each was materially injured in fortune. It is stated that lord Spencer expended above 100,000*l*. and each of the other noblemen nearly 50,000*l*.

Churches.—There were formerly seven parish-churches within the walls of Northampton; respectively dedicated to All-Saints, St. Giles, St. Gregory, St. Mary, St. Michael, St. Peter, and St. Sepulchre. Besides these, there was St. Catharine's, a chapel of ease to All-Saints, in the town; St. Edmund's church, without the east gate, and St. Bartholomew's, without the north gate. Of these structures four only are remaining at present, into which number of parishes the town is divided; All-Saints, St. Giles's, St. Peter's, and St. Sepulchre's. The church dedicated to All-Saints, situated about the centre of the town, having been consumed by fire in 1675, was begun to be rebuilt soon afterwards, and was completed in the year 1680, and the first sermon was preached by the bishop of Peterborough, Sept. 5th. 1680. The interior of this is very unlike the generality of churches. The windows and architectural ornaments are neither Gothic, Grecian, nor of any regular order or style. It consists of one large room or space, with a square chancel at the east end, and a tower at the west end: near the centre are four large columns supporting a flat roof, from which rises a dome or cupola. Attached to the west end of the church is a tablet recording the name of John Bailes, who was born in this town, and lived to a very advanced age; retaining his faculties of "hearing, sight, and memory to the last. He lived in three centuries, and was buried the 14th of April, 1706." Bridges observes, that "his age appears to have been assigned conjecturally to 126; he was at most but 114 years old." After his death he was dissected by Dr. James Keill, who published an account of the appearances, &c. of the corpse, in the Philosophical Transactions, N^o 306, art. 8.

St. Giles's church is situated near the eastern end of the town, immediately within the ancient town-wall. This is a large pile of building, and consists of a nave, aisles, transept and tower rising from the centre. At the west end is an ancient door-way, with a semicircular arch, and Norman mouldings.

St. Peter's church is seated at the western extremity of the town, in the vicinity of the castle, and was probably erected by one of the first Norman earls of Northampton. From the register of St. Andrew's priory in this town, it appears that the rectory of St. Peter's was given to that monastery by Simon de St. Liz, and was confirmed to it with the chapelries of Kings-thorpe and Upton, by Hugh Wells, bishop of Lincoln. The architecture of this church is curious and interesting. In some particulars it may indeed be considered an unique edifice. It consists of a nave and two aisles of equal length, having seven columns on each side, three of which are composed of four semi-columns. The four single shafts are ornamented with stone bands, of four mouldings near the centre; but the clustered columns, which seemed more to require this appearance of binding, have no such appendage. All the capitals are charged with sculpture of shell-work, heads, animals, &c. These capitals have lately been cleaned, and the rich and curious sculpture with which they are charged is fully displayed. This arduous and laudable task was performed by Miss A. Baker of Northampton. On each side of the nave are eight semicircular arches, with indented zigzag mouldings on the face and soffits. Over these was a series of six small windows, with semicircular heads on each side. But the most decorated and curious part of the interior of this singular structure, is the great archway,

archway, beneath the tower, at the western end of the nave. This consists of three receding arches, each charged, both in elevation and soffit, with zigzag mouldings. On each side of the archway are three pilaster columns, some of which are ornamented with spiral and lozenge mouldings. The exterior of the church and tower is equally curious, though the architectural and sculptural decorations are not so profuse or elaborate. At the south-west and north-west angles of the tower are buttresses of peculiar form. Each consists of three semi-columns, gradually diminishing at every story. On the north and south sides of the same are two series of arcades; and at the west end one range corresponding; with a blank arch, having three rows of flat stones, charged with varied tracery in the pannels.

St. Sepulchre's church, near the northern extremity of the town, is another singular and curious specimen of the ecclesiastical architecture of England. This also, like St. Peter's, may be considered unique, having some features and peculiarities unlike any other of the country. It consists of a square tower with a spire at the west end; a circular part, and a square east end, of three aisles. This and the tower are additions, of a comparatively modern date to the original edifice. Part of the circular building is evidently very ancient, probably before A.D. 1200; but various alterations have been made at different times. Within a circular exterior wall, is a series of eight columns also disposed in a circle. From these arise eight arches in the pointed style, but completely plain and unadorned. Over the columns the wall assumes an octangular shape. Four of the pillars have square bases and capitals, whilst those of the others are circular. A ground plan, or elevation of one side of the nave, a perspective view of the interior, and another of the exterior, with a history and description of this edifice, are published in the second volume of the *Architectural Antiquities of Great Britain*.

Northampton formerly contained several monastic establishments and edifices, but few of these are now remaining. The priory of St. Andrew was situated at the north-western part of the town, near the river, and was founded anterior to the year 1076; for in 1084 Simon de St. Liz repaired the buildings, and augmented the endowments.

The Franciscans, or Grey friars, had an establishment in Northampton soon after their coming into England. They originally hired an habitation in St. Giles's parish, but afterwards built one on ground given them by the town in the year 1245. Near this house was a priory of Carmelites, or White friars, founded in 1271, by Simon Mountfort and Thomas Chetwood.

The Dominicans, or Black friars, were settled here before 1240. John Dalington was either founder, or a considerable benefactor to this establishment.

William Peverel, natural son to the Conqueror, founded here, before 1112, a house of Black canons, in honour of St. James.

The Austin friars, or Friars Eremites, had a house in Bridge-street, founded in 1332, by sir John Longueville, of Wolverton, in Buckinghamshire; and several persons of his name were interred here.

The college of All-Saints was founded in 1459, with liberty of purchasing to the value of 20 marks. It consisted only of two fellows.

The hospital of St. John, for women, an ancient building in Bridge-street, consists of a chapel, a large hall, and other apartments. It was founded for the reception of infirm poor persons, probably by William St. Clere, archdeacon of Northampton, who died possessed of that dignity in 1168.

Near this place, close to the site of the south gate, is St. Thomas's hospital for women, founded in 1450, in honour of St. Thomas Becket. It was first endowed for twelve poor people, but an additional revenue was granted by sir John Langham, in 1654, for six more.

Among the public buildings and establishments of the town, none is of greater utility or larger size than the General Infirmary, which was begun in 1791, and opened in 1793. It stands on the eastern side of the town, but detached from it, on the brow of a hill which gradually slopes to the south. The building, which cost about 10,000*l.* consists of three stories above ground, and one beneath, and is admirably disposed for the reception and accommodation of the sick. One side of the house is appropriated to male, and the other to female patients. The whole was designed and built by Mr. Saxton, architect, and is faced with stone from the Kings-thorpe quarries, the proprietor of which made a present of the whole. The establishment is supported by the interest arising from numerous legacies, and from annual subscriptions. According to the report of the committee in August, 1809, there appear to have been cured during the preceding year, "1859 in and out-patients," and since the first opening of the infirmary, in 1744, there have been 44,147 persons "perfectly cured," besides 5780 who had received "great benefit." Exclusive of medical and surgical aid, the establishment provides, what are no mean auxiliaries in the cure of distempers, *proper accommodations, constant attention, with wholesome and nutritious food*. "In our charitable abode," says the committee, "nothing is denied that can any way promote recovery."

Near All-Saints church is the old county gaol, now converted into the turnkey's lodge and debtor's prison. It was originally built by sir Thomas Haslewood as a private house. Behind this is the new gaol, which was begun in 1791, and finished in 1794.

The town-gaol in Fish-lane is a small modern building.

Near the east end of All-Saints-church is the county-hall, or sessions-house, a large room fitted up for the two courts of nisi prius and crown.

At the northern extremities of the town is a range of modern buildings, erected in 1796, and appropriated to barracks. A new theatre has been built in Gold-street.

Schools.—A blue-coat school was established here about the year 1710, by John Dryden, esq. of Chesterton. There are also a brown-school, a green school, and a girl's school, established in this place. Latterly there have been schools established here on Lancaster's and Bell's plans.

In the year 1778, an act of parliament was obtained for paving, lighting, watching, &c. the town; but this being found insufficient, a new act was procured in 1797. To carry this into effect, the commissioners expended about 10,000*l.*, to meet the interest of which, a rate of 1*s.* 6*d.* in the pound is levied on the rental of the houses. In consequence of this act, nearly all the streets and lanes of Northampton are paved, both for carriages and for foot-passengers; and as the town is chiefly built on the slope, and near the top of a hill, it is generally clean and pleasant. Near its centre is a large open area, surrounded by shops and private houses, called the square, or market-place. In the town are several chapels, appropriated to different sects or religious societies. That called the Castle-hill meeting, is a large, commodious building, and belongs to the Independents. The justly celebrated Dr. Doddridge preached here for 22 years, and also superintended an academy, which, by his learning and judicious management, obtained considerable reputation.

Another meeting-house for Independents was erected here

in 1776, in which are several small but handsome monumental memorials. The Baptists' meeting, a large building, was formerly noted by the preaching of the Rev. S. Ryland, who officiated in it for some time, and was buried here. The Moravians, Methodists, and Quakers have also chapels in the town. In the year 1811, this town was found to contain 1623 houses, and 8427 inhabitants.

Northampton has given birth to some persons of eminence, who may properly be classed among the worthies of the county. Richard and Adam of Northampton were both born here, and both were advanced to the episcopal see of Ferns, in Ireland; the first in 1282, and the second in 1322.

John of Northampton, or, according to his Latin name, Joannes Avonius, was a Carmelite friar in this his native place. He was the inventor of the *Philosopher's Ring*, a kind of perpetual almanac.

Dr. Samuel Parker, bishop of Oxford, was a native of this place; as were Dr. Thomas Cartwright, bishop of Chester; William Beaufu, a Carmelite friar; and Robert Brown, the celebrated founder of the Brownists.

About one mile south of Northampton, on an elevated bank adjoining the public road, is an elegant stone cross, which was erected by king Edward I., in memory of his deceased queen Eleanor. This interesting monument of ancient architecture and conjugal affection, has been already noticed in a preceding volume of our work under the word *Cross*. On the ridge of a hill west of this place is an ancient encampment, called Hunsborough, of nearly an oval form, consisting of a double vallum, with a single fosse, and containing an area of about one acre. One mile S.W. of Northampton is Delapre abbey, the seat of Edward Bouverie, esq. The present house occupies the site of a nunnery, which was founded in the time of king Stephen, by Simon de St. Liz, jun. earl of Northampton. In the neighbouring village of Hardingstone was born James Harvey, author of "*Meditations among the Tombs*," &c. History and Antiquities of Northamptonshire, by J. Bridges, esq. and the Rev. P. Whalley, 2 vols. folio. Beauties of England, vol. xi. by J. Britton, and the Rev. J. Evans.

NORTHAMPTON, a large uneven county of Pennsylvania; in the N.E. corner of the state, on Delaware river, which separates it from New Jersey and New York; it is divided into 27 townships, and contains 30,062 inhabitants.—Also, a township in Buck's county, Pennsylvania, including 942 inhabitants.—Also, a town in Northampton county, Pennsylvania, on the S.W. bank of Lehigh river, five or six miles S.W. of Bethlehem, containing 573 inhabitants.—Also, a county of Halifax district, North Carolina, bounded N. by the state of Virginia, containing 12,331 inhabitants, of whom 6206 are slaves.—Also, a maritime county of Virginia, on the point of the peninsula, which forms the E. side of the entrance into Chesapeake bay; having the ocean E., and Accomack county N.; its southern extremity being Cape Charles, in N. lat. 37° 11', and W. long. 75° 57', off which is Smith's island. This county, the lands of which are low and sandy, contains 3585 inhabitants, and 3178 slaves. In this county is "Northampton court-house," 40 miles S.S.W. of Accomack court-house; 43 miles N.E. of Norfolk.—Also, a respectable post-town and capital of Hampshire county, Massachusetts, situated within a bend of Connecticut river, on its W. side; 40 miles N. of Hartford; and containing a spacious congregational church, a court-house, gaol, and about 250 dwelling-houses, of which many are handsome buildings. Its meadows are extensive

and fertile; and it carries on a considerable trade. This township was incorporated in 1685, and contains 2190 inhabitants.—Also, a township in Burlington county, New Jersey, comprehending about 56,000 acres, half improved and half mostly pine-barren. The chief place is "Mount Holly." It contains about 150 houses, an episcopal church, a Friends' meeting-house, and a market-house; 22 miles from Trenton.

NORTHAMPTONSHIRE, a county of England, and nearly in the centre of the island, is bounded by Leicestershire, Rutlandshire, and Lincolnshire on the north; by Cambridgeshire, Bedfordshire, and Huntingdonshire on the east; by Buckinghamshire and part of Oxfordshire on the south; and the Charwell secures it from another part of Oxfordshire, whilst the river Leam, for a short distance, and the old Roman Watling-street, separate it from Warwickshire on the west. The extent of Northamptonshire may be estimated at nearly 66 miles in its longest diameter, viz. from its most western verge at Aynho to the remotest north-eastern limit near Crowland. Its greatest breadth, from Hargrave in the east to Barby in the west, is estimated at about 30 miles; yet its average width, perhaps, is not 20 miles; and from Brockley across to Aftrop in the south, also from Peterborough in a northerly direction to Peakirk, it does not exceed eight miles. The circumference may be considered 216 miles, and the superficial area of the whole has been computed at 550,000 acres; but the latest authorities referred to in the poor returns to parliament, state it to be 617,000 acres, of which 290,000 are said to be arable; 235,000 in pasturage, and about 86,000 uncultivated, including woodlands. It contains 1 city, 11 market-towns, 336 parishes, and, according to the population return of 1811, there were then 28,995 houses, and 141,353 inhabitants.

At the time of the general Norman survey, there were 30 hundreds and wapentakes in the county of Northampton, as we find them recorded in Domesday Book. When this survey was made, a considerable part of Rutlandshire was included in the county of Northampton; but in the fifth year of king John we have mention made of it as a separate shire; and by an inquisition taken in the fourth of Edward I. it was certified to have been given by Henry III. to the king of Almain. By a later division the hundreds were reduced to twenty-eight, and in the reign of Edward II. they were further contracted to the present number of twenty, and were called by the names which they now bear; ten being comprehended in the eastern division of the county, and ten in the western.

Roman Antiquities, &c.—When the Romans took possession of the central part of Britain, they found it occupied by a tribe of people known by the name of Coritani; these being subjugated, their conquerors soon began to form military roads and fortresses. Two great roads, or via-frata, crossed the county; and were directly, or collaterally, connected with several permanent stations, temporary encampments, and vicinal ways. The Watling-street, in proceeding from the south towards the north, enters Northamptonshire at or near Stratford, and, continuing in almost a direct line across the county, leaves it at Dove-bridge. On this course there appears to have been three stations, as mentioned both in the second and sixth Iters of Antoninus; and also in the Itinerary of Richard of Cirencester. These were Lac-todorum, 17 Roman miles from Magiovinium, Bennavenna, or Isannavotia, 12 miles from the first; and Tripontium, 12 miles distant from the latter. Much difference of opinion has prevailed among antiquaries respecting the sites of these stations; and it will not be an easy task to reconcile the disputes of those who argue from maxims of theory rather than

than the evidence of remains, situations, and probable descriptions. From the known and indisputable station of Verulam, St. Alban's, the Watling-street, in its progress northward, passed Durocobrivis, near Dunstable, and Magiovinium in the vicinity of Stratford. From this to Laetodorum was 17 miles, which distance, with the name still retained of Towcester, and the vestiges of the place, are tolerably satisfactory proofs as to the site of this station. The bishop of Cloyne says that Towcester, unequivocally, "must have been the Laetodorum." The next Roman town on this road was Benaventa, or Bennavenna, which has been placed at Wedon-Bec, at Cattle-Dykes, and near Daventry; but the superior claims of the latter are decisive from a mere cursory view of each place. Here is the immense encampment called Borough-Hill; also the remains of other fortifications named Burnt-Walls, &c. in a valley to the west. In an adjoining wood, close to the present turnpike road, are other military works, called John of Gaunt's castle, which probably constituted part of the Roman station. Twelve miles north of this was Tripontium, a name descriptive of its situation and character. This station is usually assigned to Lilburn, where is a conical, artificial hill, possibly the keep of a fortress, and some castrametations. Causeways, pavements, and other ancient vestiges, have been found here.

Besides the stations and roads already noticed, there appear to have been other works of the Romans on the western side of this county. The great encampment called Cattle-Dykes, south-west of Wedon, appears to have been either formed or altered by the Romans. It was a fortress of great strength and magnitude. About three miles to the east is Nethers Heyford, where part of a tessellated pavement was discovered in 1699. This was, however, only a fragment of a common floor, though Moreton describes it as "a noble piece of art, exceeding all that I have seen or read of."

About three miles south-west of Daventry is Arbury Banks, a large encampment on the summit of a hill. Moreton and Reynolds attribute this to the Romans; and the former describes it as being on "one of the highest hills in the county." At Guilsborough are some entrenchments called "The Boroughs," which Dr. Stukeley pronounced to be "traces of a Roman camp." In the south-western angle of the county, between the village of Aynho and Newbottle, is another entrenchment, called Raynsbury camp. From what has been already stated, it is evident that the western side of Northamptonshire abounded with military posts during the Roman colonization of England; and from reviewing this district with the parts of Warwickshire and Oxfordshire immediately adjoining, we shall find such other traces of the Romans, as may serve to develop their general systems of military and political tactics. In nearly a direct line south from Raynsbury camp, in the county of Oxford, the remains of a Roman road, called the Porkway, point towards Alcester and Chesterton; and nearly parallel with that street, is a raised mound named Aveditch-bank. These appear to have formed a communication between the fortresses of Chesterton, and that of Raynsbury: it is, indeed, extremely probable that the same road continued to, and formed a connecting line with, the other great works at Cattle-Dykes, Borough-Hills, &c.

For the other ancient remains which may be strictly attributed to the Romans, we shall refer to the eastern side of the county, where the Roman road called the Forty-footway, or Ermine-street, is found. This enters the county from Huntingdonshire near the village of Castor, where it passed the Nen river. Parts of this road are still lofty and

conspicuous between Castor and Upton; and again in the parish of Barnack. The only station in this county on the line was Durobrivæ, which was at or near Castor.

In order to shew that the Romans occupied places and established permanent habitations in other parts of the county, it will be sufficient to point out the spots where vestiges of those people have been found. The most considerable of their remains are some tessellated pavements, or floors of different rooms, which were found at Weldon in the year 1738. The plan displayed a long gallery about 90 feet by 10; which communicated with seven other apartments. The whole formed nearly a parallelogram of 100 feet by 30; and consisted of foundation walls and floors made of tesserae, laid in the common patterns. Numerous coins of the lower Roman empire, and several of Constantine, Constans, &c. were discovered at the same time.

At Cotterstock, near Oundle, a tessellated pavement was found in the year 1736. It measured about 20 feet square; and among the rubbish were found fragments of urns, with shells, tiles, horns, and bones of beasts. In the year 1798 some further discoveries were made in the same field; consisting of one pavement nearly perfect, and fragments of others; also several coins, &c.

At Thorpe, near Peterborough, Dr. Stukeley says that a Mosaic pavement was found; and at Stanwick, near Higham-Ferrers, Bridges describes a tessellated floor to have been found. The names of Ilchester and Chester near Wellingborough, induce us to expect something Roman there, and accordingly we find the remains of an encampment at Chester, of nearly a square form, which included an area of about 20 acres within its outer banks. Parts of brick pavements, coins, foundations of walls, and other ancient relics, have been found at this place, which is on the banks of the river Nen.

Near the same river in Woodford field are "manifest signs," according to Moreton, "of a place possessed by the Romans." Fragments of tessellated pavements, an urn, and some other remains have been found at this village.

Such are the chief vestiges which have been discovered relating to the Romans in this county; and from these it is evident, that nearly the whole of the open parts of it was subservient to their military domination. On the banks of the Nen and Welland, it is probable that they occupied other fortresses and villas; but these have never yet been sufficiently explored, or the entrenchments satisfactorily described.

Saxon and Norman Eras, Encampments and Castles.—Soon after the Saxons had usurped possession of Britain, they subdivided it into different kingdoms or states; and the present county was included within the Mercian monarchy. Under this the great monasteries of Medenhamstead, now Peterborough, and Croyland in the same district, were founded. Indeed the former was the first, in the time of formation, and most important in size and consequence within the kingdom of Mercia; and this, like its neighbour at Croyland, was plundered and burnt by the Danes in their different predatory excursions into this part of the island. Medenhamstead, however, became so famous, that it was called Urbs-Regia, the royal city; and just before the Roman conquest it was pre-eminently distinguished by the title of Aurea Civitas, or golden city. From king Wulfere's charter of endowments and privileges to this monastery, dated 664, we learn that several places in the vicinity were tributary to it. Among these, the following names of towns and villages occur, Wansford, Cliff, called King's Cliff, Eftune, now Easton, and Northborough. Other places are named in king's Edgar's charter, anno 972.

Oundle, then called Undale, is recorded in the Saxon Chronicle, A.D. 709, when bishop Wilferth died there. In Edgar's charter this place is mentioned as a market-town of considerable note.

At Stamford Baron the monks of Medenhamstead kept a monetarium, or mint.

It is not only probable, but well authenticated, that the Saxons, Danes, and Normans alternately and successively took possession of the chief Roman stations, and adapted them to their respective modes of attack and defence. In this county Toseceaster, or Towcester, was burnt by the Danes, but king Edward ordered it to be rebuilt, and about the same time it was encompassed with a wall of stone.

Ecclesiastical History, &c.—During the Saxon dynasty, this county was under the episcopal jurisdiction of Dorchester, in Oxfordshire, and after the year 1072 subject to that of Lincoln. It continued a part of that diocese, till Henry VIII., having seized the temporalities, and secularised the abbey of Peterborough, appointed this town and church as one of the new sees in the year 1541; at the same time he ordained, by letters patent, that it should consist of a bishop, a dean, six prebendaries, and an archdeacon. A further account of the cathedral and its establishments, with some particulars of the bishops, will be given under the head PETERBOROUGH.

Geographical Features, Natural History, Rivers, Canals, Forests, &c.—At a former period the greatest portion of Northamptonshire was occupied by the forests of Salcey, Whittlewood, and Rockingham; and these still cover above 18,000 acres of land. This space, however, is not wholly devoted to woods. For within the boundaries numerous deer, cattle, horses, and sheep are fed. Many of these are afterwards fattened on the rich grazing lands of the county and then sent to the London markets. The prevailing system of husbandry is grazing, and many of the farmers are justly noted for their skilful management, both of their land and stock.

The surface of this county is peculiarly advantageous for cultivation, having neither dreary wastes nor rugged mountains; but is every where sufficiently regular for all the purposes of husbandry and tillage. Every hill is cultivated, or may be kept in a profitable state of pasturage, and every inequality in the surface contributes to its ornament and beauty. The upper and middle parts of the county are abundantly covered with extensive woods, which are intersected with numerous vistas and lawns.

Mr. Donaldson, in his "General View," states, that there are 316 parishes in this county, 227 of which are in a state of inclosure, and 89 in open field; besides which, there are many thousand acres of woodlands, and a large tract of rich, valuable land, called the Great Peterborough Fen, in a state of commonage; so that supposing the inclosed part of the county under the most approved modes of management, there is above one-third of the whole, by no means in the best state of cultivation, of which it is susceptible. Without enumerating the various small commons, or the nature and extent of the common rights of pasturage, it may be sufficient to mention particularly the Great Peterborough Fen, a tract of fine level land, containing between six and seven thousand acres of a soil equal perhaps to any in the kingdom, and capable of the highest cultivation. It is situated between Peterborough and Croyland, towards the north-eastern angle of the county, and is subject to the dispasturage of the cattle, horses, and sheep of thirty-two parishes, or townships, which comprize what is commonly called the Soke of Peterborough. The right

of commonage is considered to be scarcely of any value, but if this portion of land was converted into private property, and divided into farms of a proper size, advantages both of a public and private nature must necessarily be the result.

Woodlands.—The extensive tracts of woodlands in this county consist either of forests, chases, or purlieu woods. Of the forests, the principal is that of Rockingham, which is situated in the northern part of the county, and extends for nearly twenty miles in one direction. The two large forests of Whittlewood and Salcey lie towards the southern border of the county. There are two chases, Geddington and Yardly; the former was once a part of Rockingham forest; but permission was given by the crown, many years since, to the ancestors of the Montague family to disafforest it, and convert it into a chase. Yardly chase was once a part of Salcey forest, but has also been disafforested. Purlieu woods are those which are situated in the vicinity of the forests, and which at one time formed a part of them; but the respective owners, having at some former periods obtained grants from the crown to disafforest them, and to consider them as their own private property, they are not now subject to any of the regulations of the forest woods. The purlieu woods are numerous and extensive in this county, particularly towards the southern side, and upon the borders of Rockingham forest; and besides these, there are several small tracts of woodland very advantageously situated in various parts of the county. The underwood in the forests and chases principally consists of black and white thorn, ash, fallow, maple, and a small proportion of hazel. As the history, extent, rights, and peculiarities of the forests, constitute a natural feature in the topographical annals of this county, it will be requisite to detail them more fully.

The forest of Salcey is situated near the south-eastern border of the county, where it joins Buckinghamshire. From a perambulation made in the time of king Edward I., it appears, that the limits had been extended by king John; but that the woods and lawns, afforested by that monarch, were disafforested by Edward, according to the tenour of the Charta de Foresta, and in consequence of a grant of a fifteenth part of the moveables of all his subjects.

The lands now considered as forest, and in which the crown is possessed of the timber and other valuable rights, extend in length about two miles and a half, and in breadth nearly one mile and a half, and contain 1847 acres, 23 poles. The whole is divided into four walks, viz. Hanslop, Piddington, Hartwell, and the Deputy Ranger's walk. By the custom of this forest, the underwood of the several coppices is cut in rotation at twenty-one years growth; and after each cutting the coppices are inclosed so as to exclude the commonable cattle of the forest for nine years; but the deer are admitted into them two years sooner by means of creeps and deer leaps made in the fences. At the end of nine years they are again thrown open, and continue so the remaining twelve years, until the period of cutting the underwood returns. This forest is under the government of the following officers, viz. a warden or master forester, lieutenant or deputy warden, two verderers, a woodward, three yeomen-keepers of the several walks of Hanslop, Piddington, and Hartwell, one page keeper, and the surveyor general of the woods and forests.

The number of deer kept in this forest is about 1000 of all sorts; and the number killed annually is about 28 brace of bucks, and 20 of does; of which four bucks and four does are supplied for the use of his majesty's household, in pursuance of warrants from the board of green cloth.

NORTHAMPTONSHIRE.

In a survey taken in 1783, there were reported then to be in this forest only 2918 oak trees fit for the navy, (including all trees down to 30 feet of timber,) containing by computation 3745 loads of timber, square measure; and only 194 scrubbed, dotard, or defective trees of above 30 feet each; besides browse trees, of which there were 8266 oak trees, containing by computation 7338 loads of timber, square measure, and 8914 browse ashes: so that the timber fit for the navy, according to this survey, was little more than one-tenth part of the quantity fit for naval use, growing in this forest in 1608.

The forest of Whittlewood, though principally belonging to the county of Northampton, extends into the adjoining counties of Oxford and Buckingham, and has been formerly of very considerable extent. This forest, as well as that of Salcey, is part of the honor of Grafton. A perambulation made in the reign of Edward I., describes separately the parts lying within the three counties above named. The bounds of the forest, and the operation of the forest laws, were greatly extended in the 15th of Charles I.; but an act of parliament, in the next year, restored the ancient limits, as prescribed by the perambulation of Edward I., and confirmed, 20 James I. But a part only of the lands within those limits seems now to be considered as forest: that part contains 5424 acres, 1 rood, 11 poles, and is almost entirely encompassed with a ring mound, which has been its boundary beyond the memory of the oldest man.

The whole is divided into five walks, *viz.* Hazelborough, Sholbrook, Wakefield, Hanger, and Shrobb: the first situated in the parishes of Whitfield and Silverstone; the second in that of Whittlebury; the third in the parishes of Whittlebury, Potterbury, Passenham, Denshangen, and Lillington Dayrell; the fourth and fifth in the parish of Passenham. By grant of 11 Ann, the duke of Grafton holds the office of lord warden, or master forester, which gives him the possession of the chief lodge, called the Wakefield Lodge, with the gardens, pleasure-grounds, and inclosed meadow-lands, containing together nearly 117 acres, with the pasturage for cattle, in common with the dean, in an inclosed lawn, called Wakefield Lawn, containing upwards of 245 acres. His grace has also, as hereditary keeper, the custody and management of the deer. No more, however, seems to have been required from his family, since the date of the patent, than to answer certain warrants for the supply of his majesty's household, and the public offices, or others accustomed to have venison from the royal forests. The residue appears to have been left to the disposal of the lord warden.

The number of deer at present kept within the forest is computed to be about 1800 of all sorts; and the number killed, one year with another, is about 138 bucks, and 100 does.

In the survey made in the year 1608, Whittlewood forest is stated to contain 51,046 timber trees of oak, then valued at 25,755*l.*, and 360 decaying trees, valued at 123*l.* 6*s.* 8*d.* The quantity of timber is not mentioned; but, according to the computation mentioned in Salcey forest, it must have been from 40 to 50,000 loads, girt measure, or from 60 to 75,000 loads, square measure.

By the survey taken in 1783, there appeared to be growing in this forest 5211 timber trees fit for the navy, containing 7230 loads of timber, square measure; and 402 scrubbed, dotard, and decayed trees, containing 569 loads. The same survey states, that there were 18,617 trees in the forest constantly lopped for browse for the deer, *viz.* 6335 oak trees, computed to contain 8907 loads of timber, square measure, (being more than a load and quarter each on the average,) and 12,282 ash trees, containing 3512 loads; so that the number and contents of the browsed oaks was greater than of the oak trees reported to be fit for the navy, of which the number in the coppices was not quite three trees to every two acres of land.

The forest of Rockingham is situated in the northern part of the county, and is esteemed to have been formerly one of the largest forests in the kingdom. In a perambulation, dated the 14th of Edward I., it is described as extending from Northampton to Stamford, being about 30 miles in length; and from the river Nen on the south to those of the Welland and Maidwell on the north-west, being a medium breadth of nearly eight miles. This extent was limited soon after the accession of Henry II.; but the bounds were particularly specified and settled in the 17th of Charles I. The forest consists of three separate districts, called the bailiwicks of Rockingham, Brigstock, and Clive, or Cliffe, situated at the distance of between two and four miles from each other. These three bailiwicks were formerly under the superintendence of one warden or master forester of the whole forest; which office was granted, in the 1st of James I., to Thomas, lord Burleigh, for three lives. Charles I. divided, or rather abolished, that office, and constituted three master foresters of separate districts. The master forestership of Rockingham bailiwick, with Geddington woods, was granted to Edward, lord Montague, for three lives; but no subsequent grant of it appears. That of Cliffe bailiwick was granted, in the 5th of Charles I., to trustees for Mildmay, earl of Westmoreland, for three lives, and is now held by the present earl of Westmoreland on the same tenure; and that of Farming woods, the patent for which was not sued out in that reign, was granted, in the 27th of the next, to sir John Robinson for three lives, and is now held by the earl of Upper Ossory. The other officers of this forest, in the reigns of James I. and Charles I., besides the warden, were a lieutenant, four verderers, a ranger of the forest, and under-ranger of each bailiwick, a bow-bearer, master keepers, and under-keepers of the respective walks, and twelve regarders for each bailiwick, besides woodwards and under-woodwards.

The bailiwick of Rockingham comprises divers extensive woods in the parishes of Cottingham, Middleton, Great and Little Oakley, Grettton, Little Weldon, and Corby, all of which are reputed to contain about 3500 acres.

The number of deer supplied from this bailiwick, for the use of the crown, is four brace and a half of bucks, and the same number of does; and for the forest officers, eleven brace of each: in the whole, fifteen brace and a half of each.

The bailiwick of Brigstock, which is the least of the three divisions, comprehends that part of the town and fields of Geddington which lie to the north of the river Ise; certain woods called Geddington woods, containing about 700 acres; the town and part of the fields of Brigstock; the woods called Farming woods, containing also about 700 acres; and a lodge called Farming-wood Lodge, with an inclosed lawn adjacent to it, said to contain about 200 acres. The number of deer supplied from this bailiwick is 34 bucks, and as many does.

The bailiwick of Cliffe is the largest division of the forest, and comprehends four extensive tracts of woodland, namely, Westhay woods, belonging to the earl of Exeter; Moorhay woods, belonging to the earl of Westmoreland; Earl's woods in Moorhay walk, the property of the Rev. Abraham Blackhome and others; and Sulchay woods, belonging also to the earl of Westmoreland. Those woods, with the open plains and wastes adjoining, and two inclosed lawns, called

Moorhay lawn and Sulchay lawn, held by lord Westmoreland, in right of the keepership of those walks, contain together about 4582 acres. The town and fields of Kings-Cliffe, except Cliffe park and parts of the towns and fields of Duddington, Apethorpe, Newton, Nassington, and Yarrowell, are all comprised within the limits of this bailiwick; but the woods and lawns above mentioned are the parts which are chiefly subject to the haunt and feed of deer. For further particulars relating to the forests, purlieu-woods, chafes, &c. of this county, with some judicious strictures on their general injurious system of management, the reader is referred to Pitt's General View of the Agriculture of Northamptonshire, 8vo.

Canals, &c.—The first artificial canal that was made to render any benefit to this county was the Oxford, which passes through the parishes of Aynho, Boddington, Braunston, and Barby, all on the western verge of the shire. At Braunston it joins the Grand Junction Canal, which crosses the western side of this county. This navigable cut was planned for the purpose of opening a water communication between the river Thames and the principal inland canals of the kingdom. See CANAL.

Rivers.—Northamptonshire may justly boast, and we believe exclusively, that in the important article of water it is entirely and completely independent: for of the six rivers, which flow through or intersect it, every one originates within its boundaries; and not a single brook, however insignificant, runs into it from any other district; whilst there is not a county bordering upon it, that is not in some degree supplied from its various and ample aquatic stores.

The Nen, or Nyne, though, in point of intrinsic celebrity, yielding the palm to the Ouse and Avon, yet continuing longest in, and being most beneficial to, the county, has the fairest claim to priority of notice. It has two sources: one at Chapel-well, in Naseby; the other at Hartwell, near Staverton; and both uniting at Northampton, form no inconsiderable river, winding through richly fertile meadows, reaching Peterborough, through Wisbeach to Lynn, where it is absorbed in the German ocean.

The Welland, in local importance, ranks the second in this county, and takes its rise near the vicarage house at Sibbertoft, whence having measured the short space of four miles, reaches the skirts of the county, which adopts its devious wanderings as the line of boundary during a lengthened course of nearly fifty miles, by Harborough, Rockingham, and Stamford, where it becomes navigable, through Deeping, to Croyland, when it enters Lincolnshire, and falls into the Fossdyke Wash, near Boston.

Northampton derives, comparatively, but little benefit from the four other rivers to which it gives rise, though two of them, the Ouse and the Avon, stand in the first class of British rivers; but they are both mere rivulets when they first issue from the earth, and soon desert their native district.

The Ouse (according to Morton) originates at Ousewell, in the parish of Farthingho, near Brackley, and speedily entering Buckinghamshire, revisits its parent county near Old Stratford.

The Avon, or Lesser Avon, commences its course at Avon-well, near Naseby, and flows in a westerly direction into Warwickshire.

The Leam, springing from the village of Hellidon, is immediately joined by other rills from Catesby and Staverton, and passes into Warwickshire.

The Charwell derives its name from a small spring called Charwell, near Charwelton.

Roads, Bridges, &c.—There are four great mail roads through this county, which are wide, level, and good; a

few of the collateral turnpike roads are also kept in a good state; but the cross roads are shamefully neglected. They are generally very narrow, and the farmers are either careless of performing the statute duty, or wholly neglect them. Each tenant who occupies a farm of 50*l.* is bound to give six days' labour with a cart and two men every year; but if the farmer be remiss in this duty, it appears that those empowered to interfere are equally negligent, and the public traveller is thereby subjected to much inconvenience, and even to danger.

Manufactures.—Northamptonshire is not a manufacturing county; but still many of its inhabitants are employed in, and derive a livelihood from, different species of handicraft business. The making of shoes, lace, woollen stuffs, and wool stapling, are the chief objects of manufacture, and particularly the first.

Ancient Architecture, Sepulchral Monuments, &c.—Peterborough cathedral, and its contiguous buildings, display some fine examples of the early Norman architecture. The churches of Caxton, Barnack, Earls'-Barton, St. Peter's, and St. Sepulchre's at Northampton, Barnwell, Twywell, and Stratton, are all distinguished by semicircular arches, short columns, with corresponding mouldings, &c. In some of these churches are ancient piscinas, fonts, stone stalls, &c. At Fotheringhay is a spacious, handsome, collegiate church, with a lofty tower; and at Oundle, Luffwick, Kettering, Higham-Ferrers, Wellingborough, and Finedon, the churches are large and elegant. The crosses at Geddington, and near Northampton, are interesting examples of the architecture and sculpture of Edward I.'s reign. Of ancient mansions, the following are remarkable for their extent, and for their styles of architecture: Burleigh, Kirby, Castle-Ashby, Fawsley, Rushton, and Drayton. In Warkton church are three large marble monuments with statues, &c. to the Montague family; and in Weekly church are altar tombs, with effigies to the same family. At Brington are several costly tombs in memory of the Spencers of Althorpe. The church of Stowe is remarkable for a very interesting altar monument with a recumbent figure, probably a portrait, by N. Stone, of Elizabeth Latimer, wife, first to sir John Danvers, and secondly to sir Edmund Carey. The church at Easton-Neston is rendered memorable by several sepulchral memorials to the Fermors, earls of Pomfret. In Stamford Baron church are some gorgeous monuments to the Cecils of Burleigh. The cathedral church of Peterborough contains some sepulchral mementos, but few of these are of distinguished importance. The persecuted Mary queen of Scots is recorded by a cenotaph; Catherine of Arragon, first wife to king Henry VIII., was also interred here.

In the church at Rockingham, the Watsons, now baron Sondes, have usually been interred, and some monuments have been raised to their memories. Luffwick church is not more distinguished for its architecture than for the monuments that adorn its interior; for here are several to the different families of Stafford, Vere, Mordaunt, Green, &c. It contains also some fine specimens of stained glass. In Castle-Ashby church are some old brasses, and an ancient tomb with an effigy of a knight armed.

The church of Easton Maudit contains three or four monuments with statues, canopies, &c. to the Yelvertons. In Horton church is a curious tomb to William lord Parr, uncle to Catherine; also brasses to Roger Salusbury and his two wives. Hardington church has two old tombs and a fine monument by Rysbrack. At Fawsley are several mural slabs, brasses, and finely sculptured monuments to different persons of the Knightly family. In Stean church a branch of the Crewe family of Cheshire was formerly interred, and several

Several tombs are preserved to record the names of different persons. Marham church contains some monumental memorials to the Fitzwilliams of Milton. History, &c. of Northamptonshire, two vols. folio. The Natural History of Northamptonshire, by John Morton, M. A., folio. General View of the Agriculture, &c. of Northamptonshire, by Pitt: Ditto by Donaldson. Beauties of England, vol. xi, by J. Britton and the Rev. J. Evans.

NORTHBOROUGH, a township of America, in Worcester county, Massachusetts, incorporated in 1760, and containing 698 inhabitants; 10 miles E. of Worcester.

NORTHBRIDGE, a township in Worcester county, Massachusetts, bounded S. by Uxbridge, incorporated in 1772, and containing 544 inhabitants; 12 miles S. by E. of Worcester.

NORTH CAROLINA. See **CAROLINA**.

NORTH-CASTLE, a township of America, in West Chester county, New York, N. of Mount Pleasant, and the White Plains on the borders of Connecticut; containing 1168 inhabitants.

NORTH-EAST TOWN, a town of America, in Dutchess county, New York, about 90 miles N. of New York city; containing 3252 inhabitants.

NORTH END, a town of Matthews' county, Virginia; 185 miles from Washington.

NORTHERN ARCHIPELAGO. See **ANDREANOSKEA** and **ALEUTIAN**.

NORTHERN Aspect, or *Exposure*. See **EXPOSURE**.

NORTHERN Hemisphere. See **HEMISPHERE**.

NORTHERN Indians, in *Geography*, a name given to the wandering tribes that inhabit the region of North America, which lies between N. lat. 59° and 68°, being 500 miles wide, bounded E. by Hudson's bay, W. by the country of Athapuscow Indians, S. by Churchill river, and N. by the Dogribbed and Copper Indians. In their persons they are generally above the common size, strong, but not corpulent. They are neither active nor lively in their dispositions; they have very low foreheads, small eyes, high cheek-bones, Roman noses, full cheeks, and generally long, broad chins. On each cheek they have three or four parallel strokes marked black. In their disposition, these are morose, covetous, and ungrateful; and much addicted to deceit and imposition, and when treated with respect, insolent. Among their good qualities, we may enumerate their mildness, temperance in drinking, and aversion from riot and violence. In their marriages, they have no ceremony; the women have no choice, being betrothed by their parents in childhood. Polygamy is allowed, and wives are made to submit to the hardest labour. The men are jealous, and divorces are very common. Many of these people boil their food in vessels of birch bark, by casting in hot stones; and for want of wood they often eat their meat and fish raw. Among their dainties, they reckon maggots, lice, and blood. Fish and game are plentiful, and supply the chief part of their food; and when these fail, a black hard moss collected from the rocks is a substitute; this is boiled, and affords considerable nourishment. Their principal diseases are the scurvy, consumption, and flux. They are very much under the influence of superstition. When any of their principal Indians die, they believe that they are conjured to death. The dead are left on the ground till they are devoured by fowls and beasts. The aged are always treated with neglect, and fed with the meanest food. A custom prevails among them of exchanging a night's lodging with each other's wives. This is considered as a pledge of friendship between two families; and when either of the men dies, the other considers himself bound to support the family deprived of

a husband and father. Two or three sisters are often wives to the same husband. Of religion, in principle and practice, they seem to be lamentably destitute; though their conjurers pretend to converse with spirits. The present evil alone disturbs their minds, and they seem to have no idea of futurity. Hearne. Morfe. See **INDIANS**.

NORTHERN Light, or *Aurora Borealis*. See **AURORA Borealis**.

NORTHERN Ocean. See **OCEAN**.

NORTHERN Signs, are those six on the north side of the equator. See **SIGN**.

NORTHFIELD, in *Geography*, a township of America, in Orange county, Vermont, between 20 and 30 miles W. of Newbury, containing 204 inhabitants.—Also, a pleasant post-town in the N. part of Hampshire county, Massachusetts, on the E. side of Connecticut river; 30 miles N. of Northampton, containing 1047 inhabitants; incorporated in 1673, repeatedly destroyed by the Indians; and rebuilt in 1713.—Also, a small town in Rockingham county, New Hampshire, on the E. side of Merrimack river; incorporated in 1780, and containing 925 inhabitants.—Also, a township in Richmond county, Staten island, New York, containing 1387 inhabitants.

NORTHFLEET, a village and parish in the lower half hundred of Toltintrough, lathe of Aylesford, and county of Kent, England, is situated near the banks of the Thames, two miles distant from Gravesend, and 20 miles N.E. of London. It was anciently the property of the see of Canterbury, but was alienated by archbishop Cranmer, in exchange for other lands, with Henry VIII.; it has since had several intermediate possessors, but was finally granted by the crown to the late earl of Besborough, about the year 1758, at the annual rent of six shillings and eight-pence. Of this nobleman it was purchased by the late John Calcraft, esq. The north-west part of this parish is a low marsh, which was formerly covered by the Thames, and is now crossed by a high causeway and bridge, with flood-gates to prevent the tides flowing beyond it. The village is irregularly built round Northfleet Green, and on the sides of the high road. The parish church, which is one of the largest in the diocese, consists of a nave, aisles, and chancel, with a low tower, erected at the beginning of the last century, within the site of the foundation walls of the ancient structure, but by no means correspondent with the rest of the building. The nave is separated from the aisles by octagonal, massive columns, spreading off into pointed arches, without the intervention of capitals. The church contains several monuments of the fourteenth century; and on the north wall is one of alabaster, to the memory of Dr. Brown, eminent for his knowledge in natural history, and physician to king Charles II. In the return made to parliament, pursuant to the population act of the year 1811, Northfleet was stated to contain 372 houses, occupied by 2031 persons; of these a great number derive employment from the contiguous chalk works, which extend from the northern side of the village to the Thames; their width on an average being nearly a quarter of a mile. The chalk pits are immense; the cliffs where the chalk has been dug presenting, in many places, a precipitous surface from 100 to 150 feet in perpendicular height. The chalk forms a considerable branch of commerce, and along the shore are several wharfs for the convenience of shipping it off, both in its natural state, and when burnt into lime, for which purpose here are several large kilns. The flints also, which pervade the chalk in thin strata, are collected for sale; these form a material ingredient in the composition of the Staffordshire ware; and great quantities are exported to China.

On an elevated situation in the vicinity of Northfleet is Ingreffs, formerly called Ince-grice, the seat of Henry Roebuck, esq. It was the property of John Calcraft, esq. who died in 1772; this gentleman arranged in an elegant summer house, built in a hollow of the chalk cliffs, a valuable collection of Roman altars, brought from Italy; with statues and other specimens of Roman sculpture, placed in various parts of the garden. Haisted's History and Topographical Survey of Kent, 12 vols. 8vo. Beauties of England and Wales, vol. vii. by E. W. Brayley.

NORTHFORD, a parish of Branford, New Haven county, Connecticut, in which are a post-office, and also a Congregational and an Episcopal church; 10 miles E. of New Haven.

NORTH HAMPTON, a township of New Hampshire, in Rockingham county, containing 653 inhabitants; incorporated in 1742.—Also, a township in Montgomery county, New York; containing 996 inhabitants.

NORTH HAMPSTEAD, a township in Queen's county, Long island, New York; containing 2413 inhabitants, of whom 269 are slaves.

NORTH HAVEN, a township of Connecticut, situated in New Haven county, on the E. side of East river; 32 miles S. by W. of Hartford, settled in 1660, and containing 1157 inhabitants.

NORTH HUNTINGTON, a township in Westmoreland county, Pennsylvania, including 1484 inhabitants.

NORTHING, in *Navigation*, the difference of latitude, which a ship makes in sailing towards the north pole.

NORTH KINGSTOWN, in *Geography*, a town of America, in Washington county, Rhode island, which carries on a considerable trade in the fisheries, and also some to the West Indies; its harbour is called Wickford; eight miles N.W. of Newport. The township contains 2794 inhabitants, including 39 slaves.

NORTHLEACH, a small market town in the hundred of Bradley, Gloucestershire, England, is situated in a bottom amongst the Cotswold hills, near the source of the little river Leach, at the distance of 20 miles from the city of Gloucester, and 82 miles from London. The manor was given by king Ethelred to the abbey at Gloucester, to the monks of which Henry III. granted the privilege of two annual fairs, and a weekly market. After the dissolution the manor passed into lay hands; it came into the Dutton family at the beginning of the last century; and is now the property of James Dutton, who was created lord Sherborne in 1784.

About the beginning of the sixteenth century Northleach was of considerable importance as a clothing town; but not having a sufficiency of water to supply the increased demand of the manufacture, it gradually declined. Here was formerly a public market for wool and cloth; some of the buildings for the reception of these articles are mentioned by Rudder, in his History of Gloucestershire, as remaining, having a spacious area in the centre, and communicating, when he wrote, with each other by galleries. The town consists chiefly of one long, irregular street: the market house is an ancient structure, supported by columns; near it are several steps, and the base of an ancient cross. The church, which is a spacious edifice, consists of a nave, chancel, and side aisles, an elegant south porch, and a lofty tower at the west end, with open-worked battlements. The south porch is embellished with tracery, externally and internally. The whole summit of the building is embattled, and ornamented with pinnacles. The church contains many sepulchral memorials of opulent clothiers who lived in the fifteenth century. A free grammar school was founded here,

in 1559, by Hugh Westwood, esq., who endowed it with the impropriation of Chedworth, then producing nearly 120*l. per annum*: every fourth year an exhibitor is sent from this school to Pembroke college, Oxford, on the foundation of George Townsend, esq. The civil government of the town is vested in a bailiff and two constables. In the population return in the year 1811, the inhabitants of the parish are stated to be 647 occupying 142 houses. The market is held on Wednesday; and here are now three annual fairs.

At Eastington, a tything in Northleach parish, Dr. Woodward made a great part of his valuable collection of fossils, which he presented to the university of Cambridge. This tything is also remarkable for being the site of an ancient encampment, called Norbury, which Baxter supposes to be a corruption of Morbyrig, or the Great Camp. It was of an oblong form, inclosed with a double agger, and contained about eighty acres; but the ground having been long cultivated, the banks are in many parts levelled. From the proximity of this to the Foss-way, it has been considered as Roman.

About five miles from Northleach is the village of Sherbourn, or Sherborne. The manor belonged to the abbey of Winchcomb from before the Conquest till the Dissolution. It afterwards became the property of the Duttons; and is now possessed by lord Sherborne, who has a seat here called Sherborne House. It is an extensive mansion, and consists of two quadrangles; the eastern and most ancient part of which is supposed to have been the residence of the abbots of Winchcomb. Two parks belong to this house, each between three and four miles in circumference; in one of them is a neat lodge.

Sherbourn was the birth-place of Dr. James Bradley, who succeeded Dr. Halley as astronomer royal at Greenwich. He was born in 1692, died in 1762, and was buried at Minchin-Hampton in Gloucestershire. Rudge's History &c. of Gloucestershire, 2 vols. 8vo. Beauties of England, vol. v.

NORTHLINED LAKE, a lake of America, about 160 miles S. of the head of Chesterfield inlet, about 80 miles long, and 25 broad, full of islands. N. lat. 60° 40'. W. long. 98° 30'.

NORTHORN, a town of Germany, in the county of Bentheim, on the Vechte; eight miles N. of Bentheim.

NORTHPORT, a township of America, in Hancock county, Maine, incorporated in 1796, and containing 482 inhabitants.

NORTH SALEM, a township of America, in West Chester county, New York, opposite to Ridgefield in Connecticut, containing 1145 inhabitants.

NORTHUMBERLAND, the most northerly county of England, lies between 54° 51' and 55° 48' N. lat., and between 1° and 2° 27' W. long. It is bounded on the east by the German ocean; on the west by Roxburghshire and Cumberland; on the north by Berwickshire; and on the south by the county of Durham. Including the detached portions of the latter county, called Northamshire, Islandshire, and Bedlingtonshire, it extends 64 miles in length, and in some places 48 in breadth; and comprises an area of 1980 square miles, or 1,267,200 acres; of which 817,200 are level and susceptible of cultivation, while the remaining 450,000 are of a mountainous character, and not adapted to agricultural purposes.

Historical Events.—This county, previous to the Roman invasion, is conjectured by Camden to have formed a part of that division of Britain which was occupied by the Ottadini or Ottatini, a tribe of the Meätæ, who are mentioned by Dio Cassius as possessing the territories adjoining the Picts wall.

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wall. These people were situated more to the south and east than the Gadani, and had for their chief city Bremenium, the ruins of which are still seen near Rochester in Reedsdale. After the armies of Rome had extended their conquests to the Forth, Northumberland was included in the province of Valentia. Under the Saxon government it constituted part of the extensive and powerful kingdom of Northumbria, which is generally supposed to have reached from the north bank of the Humber to the Frith of Forth. This monarchy was begun by Ida, who arrived in Britain in the year 547, and having conquered a considerable extent of territory, assumed the purple under the title of king of Bernicia; and was succeeded by his son Adda. In the first year of this prince's reign, Ælla, a noble chieftain of Saxony, who had accompanied Ida in his expedition, made war upon the Britons in the province of Deira, drove them from their territories, and settling his followers therein, assumed the regal authority. Adda, king of Bernicia, dying in the seventh year of his sovereignty, was succeeded by four princes, Glappa, Theoiwald, Fréthulf, and Theodric, of whom nothing is known but their names, and the number of years they respectively swayed the sceptre. On the death of the last of these monarchs Ælla acquired the sovereignty of both kingdoms, which he united under the name of the kingdom of Northumberland. This prince enjoyed his conjunct rule only three years, when he died, leaving issue a son and a daughter, Edwin and Acca, but as the former was yet too young to take upon himself the government, Ethelric, the second son of Ida, was raised to the throne. His reign lasted during five years of profound peace, at the end of which time he departed this life, and left the kingdom to his son Ethelfrith, who, the better to insure the stability of his sway over Deira, which of right should have descended to Edwin, espoused Acca, the sister of that prince. Ethelfrith, ambitious of military renown, was constantly engaged in war for the first twenty years of his reign, either with the Britons or the Scots, whom he defeated in several desperate engagements, and spread the terror of his arms even among the Saxon states. This train of success, having ultimately led to peace with all the neighbouring kingdoms, Ethelfrith had leisure to examine more closely his affairs at home. He looked with a jealous eye on young Edwin, whose title to the throne of Deira was unquestionably preferable to his own, and fearing that he might one day be induced to assert his rights, resolved to remove this obstacle to his happiness, by murdering the prince. He, however, being by some means made acquainted with the intended treachery against him, fled from Northumberland, in company with his wife, and sought refuge at the court of Redwald, king of the East Angles. This prince, by the persuasion of his queen, determined rather to hazard the fortune of war, than deliver up Edwin to the messengers of the Northumbrian monarch, who demanded him with all the arrogance of a conqueror towards his vassals. Accordingly collecting his forces, he followed the ambassadors with such expedition as astonished Ethelfrith, who, nevertheless, advanced against him with perfect confidence of success. Both armies met upon the banks of the river Idle, where a sanguinary engagement ensued, in which Regenhere, the son of Redwald, was slain. Victory, however, declared for the East Anglian; and as Ethelfrith himself also fell in the action, and his sons were yet infants, Edwin found little difficulty in obtaining possession of the Northumbrian crown.

Of all the princes of the heptarchy at this period, Edwin was undoubtedly the greatest, being no less distinguished for his influence abroad, than for his rigid and impartial administration of justice within his own dominions. He reclaimed

his subjects from the licentious life to which they had hitherto been accustomed, and established so excellent a system of police in every part of his kingdom, that it became proverbial to say, a person might do any act with as much safety as a woman or child could pass through Northumberland with a purse of gold in their hand; meaning thereby, that there was not the smallest danger to be apprehended from its execution. Every individual placed near his throne loved him; and he was one of those few monarchs who could boast of the sincere attachment of his ministers and favourites. Of this happy fortune, there is a remarkable instance upon record. Guichelme, king of Wessex, envying his glory, but fearing to wage open war against so gallant and powerful a prince, determined to cut him off by treachery. With this view, he sent as ambassador to his court, one Eumer, a villain adequate to the most bloody and atrocious deed, who having obtained admittance to the king, under the pretence of delivering a message from the West Saxon prince, drew his dagger, and would have murdered Edwin on the spot, but for the noble conduct of Lilla, an officer in his army. This heroic soldier perceiving the danger of his prince, and having no other means of defence, suddenly interposed his own body between him and Eumer's dagger, and was pierced to the heart. Exasperated at this barbarous design, which, though it failed of its avowed purpose, had deprived him of so valuable a friend as the murdered Lilla, he marched an army into Wessex, and being every where successful, either slew or made prisoners all who had any share in his intended assassination, and rendered the kingdom tributary to the crown of Northumberland.

About this time the East Angles having conspired against their king, Redwald, put him to death, and offered the sceptre to Edwin. But this prince, notwithstanding his vast ambition, possessed a mind superior to the base feeling of ingratitude. Instead, therefore, of grasping at the opportunity thus afforded him, of adding another powerful kingdom to his already extensive territories, he remonstrated with the deputies on the barbarity of their regicide, and declared his determination to support Earpwold, the son of Redwald, on the throne of his father. Hitherto the Northumbrian Saxons continued to worship idols, and though some attempts had been made to convert them to Christianity, all had failed to effect that desirable object. The period, however, was now arrived in which they were destined to receive the blessed doctrines of the gospel. Edwin's first wife having died while he resided at the court of Redwald, he married, for his second, Ethelburga, the daughter of Ethelbert, king of Kent, who was already converted, and had established the religion of Jesus throughout every portion of his dominions. That lady, emulating the glory of her mother, Bertha, by whose zeal that happy result had been accomplished, carried Paulinus, a learned bishop, along with her, and besides stipulating a toleration for the exercise of her own worship, which was readily granted, used every effort in her power to induce her husband to adopt it also. Edwin, like a prudent prince, promised to examine the principles upon which her faith was founded, and declared that if they appeared more agreeable to the dictates of reason than the foundations of his own, he would willingly comply with her request. Accordingly he held several conferences with Paulinus, canvassed the arguments with the wisest of his counsellors, and after a serious and long inquiry, decided in favour of Christianity. But though allowed to exercise their judgments on the great question of their salvation, the people did not reject the truths offered to their consideration. The Northumbrians, almost to a man, threw off the shackles of idolatry, and embraced the new religion. Unhappily, however, the

succession

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succession of events which followed this important era proved hostile to the immediate consummation of the glorious destiny so auspiciously begun. Penda, the Pagan king of Mercia, stimulating Ceadwallo, king of the Britons, to take up arms, and throw off the Northumbrian yoke; the two monarchs joined their forces, and waited the advance of Edwin, who had already taken the field with a powerful force to quell the insurrection. A place called Hatfield Chace, in Yorkshire, was the scene of contest. Both armies performed prodigies of valour, but Edwin and his son being killed in the action, the Northumbrians, losing confidence, immediately gave way, and in the end were defeated with immense slaughter.

Penda and Ceadwallo now penetrated into the kingdom of Northumberland, and spread death and desolation every where around them. Penda in particular, if belief can be given to the monkish historians, directed his savage vengeance with ten-fold cruelty against the Christian inhabitants; till at length fated with blood, both he and the British monarch retired to their own dominions. Eanfred, the son of Ethelfrith, now returned with his brothers Oswald and Oswy from Scotland, and took possession of Bernicia, his paternal kingdom; and Ofric, the cousin-german of Edwin, established himself in Deira, the inheritance of his family. Hence the monarchy of Northumberland was again divided into two distinct sovereignties; and as the kings of each renounced the doctrines of Christianity, which they had embraced during their exile, Paganism once more became the court worship in both kingdoms. This apostacy, however, did not shield them from the rage of Ceadwallo; but most probably gave a keener edge to his sword, as he himself was professedly a Christian. Again entering Northumbria, he ravaged the country with still more ferocious barbarity than before. Ofric fell in the defence of his own city; and Eanfrid, terrified at his fate, went in person to the camp of the Welsh king to sue for peace, and implore his clemency; but notwithstanding the sacred purpose of his visit, he was arrested and put to death by the murderous tyrant.

Upon this event Oswald, the only surviving legitimate brother of the murdered prince, resolving to revenge the wrongs of his family, and taking advantage of the hatred with which the treachery of Ceadwallo had inspired his countrymen, raised a considerable army, and marched to offer battle to the execrable oppressor. A most sanguinary action ensued, in which, notwithstanding his inferiority in numbers to his enemy, Oswald was completely successful, Ceadwallo and the chief of his nobility being slain on the field, and the rest of his army routed and dispersed. This glorious engagement was fought at Dennis, on the borders of the county; and eventually enabled Oswald to assume the crown of Northumberland, by a re-union of the kingdoms of Bernicia and Deira. Oswald likewise restored the Christian religion, and succeeded, by his judicious conduct, in wholly extirpating Paganism from his dominions. He is much celebrated by the monkish writers for his sanctity and charity, which procured him the honours of canonization. Oswald died in battle against Penda, king of Mercia, and was succeeded by his natural brother Oswy, who established himself on the Northumbrian throne, by putting to death Oswin, the son of Ofric, the last king of the race of Deira. His son Egfrid succeeded him, who was slain in an engagement with the Picts, without leaving any children; because Adelthrid, his queen, refused to violate her vow of chastity. Alfred, his natural brother, consequently acquired possession of the kingdom, which he governed for nineteen years, and left it to Ofred, his son, a boy only eight years of age. This prince reigned eleven years, and was murdered by his kinsman Ken-

red, who enjoyed his usurped dignity little more than a year, having suffered the punishment of his barbarity by a similar fate. Ofric, and after him Celwulph, the son of Kenred, next mounted the throne; which the latter relinquished in favour of Eadbert, his cousin-german. He, imitating his predecessor, abdicated the crown also, and retired into a monastery. Ofwulf, son to Eadbert, perished in an insurrection soon after his accession, when the sovereignty was seized by a nobleman named Mollo, who reigned ten years, and was slain by the treachery of Alured. This prince, a descendant from Ida, first king of Northumberland, now obtained the sceptre, but, conducting himself tyrannically, was expelled by his subjects: Ethelred, his successor, was likewise compelled to renounce his authority; and Celwald, the next king, was deposed and slain by the people, and his place filled by Ofred, who, after reigning one year, made way again for Ethelred, whose death was equally tragical as that of almost all his predecessors. An universal anarchy now prevailed in Northumberland for several years, till at length Egbert, king of Wessex, subdued the kingdom, and rendered it tributary to his crown. From this time Northumberland remained in subjection to the West Saxon yoke, till it was conquered, after a bloody struggle, by the Danes, who nearly extirpated or expelled the whole of the Saxon proprietors, and settled themselves in the deserted territories.

Thus ended the powerful monarchy of Northumberland, after it had subsisted three hundred and thirty years. As the possessors of the land were now entirely Danes, Danish laws prevailed throughout its entire extent, and continued in force till the time of Edward the Confessor, when they were incorporated with the West Saxon and Mercian codes, and the whole made common to England under the name of the laws of Edward. The governors subsequent to this period were hereditary earls, who sometimes assumed the title and insignia of royalty. Edgar, however, deeming the hereditary rule of so extensive a country an elevation too high for a subject, divided it into two distinct portions; and not long after granted all the district, from the Tweed to Edinburgh, to Kenneth, king of Scotland, to be for ever annexed to his dominions. Other grants cut off additional districts about the same era, so that previous to the Norman conquest Northumberland was reduced to its present limits. These events led to important changes. This county, now rendered a frontier district with Scotland, became the principal theatre of the border wars, which raged from the time of Stephen to the union of the two crowns in the person of king James. The people of Tindale and Reedsdale, in common with the borderers of Cumberland and Scotland, were, in those days, nothing less than clans of lawless banditti, who were constantly engaged in depredatory excursions. The tract which they occupied extended about 50 miles in length, and six in breadth, and was called "the Debateable Land," both nations laying claim to it, though in fact it belonged to neither, as their utmost efforts were ineffectual for the subjection of its inhabitants, whose dexterity in the art of thieving was such, that they could twist a cow's horn, or mark a horse, so that its owner could not know either again. The English borders were divided into three marches. The western march extended from the Solway Frith to Tindale; the middle march comprised Tindale and Reedsdale; and the eastern march reached from Reedsdale to Tweedmouth. The marches were under the jurisdiction of a lord-warden general, an office of a military nature, and usually held by one of the dukes or earls of Northumberland. The executive part of the duties, however, was usually confided to a deputy, under whom were three inferior wardens. One of these officers sat, by the king's commission, as judge in the march

march courts, and assisted in framing border laws and settling treaties with Scotland. Their common business was to regulate the watches, discipline the militia, and take measures for assembling them in arms at the first alarm of an enemy in the time of war; but during peace they were chiefly employed in suppressing the infolence and rapine of the borderers.

Besides the mere border contests, several important battles have been fought within the boundaries of this county. The battle of Otterburne, where the brave earl Douglas lost his life in 1388, was decided in the neighbourhood of Otterburne-castle. This action terminated in favour of the Scots, notwithstanding the fall of their leader; sir Henry Percy, the commander of the English, being wounded and taken prisoner. John Nevil, marquis of Montague, general of Edward IV., gained a decisive victory at Hexham over the forces of the deposed king, Henry VI., and was, on that account, raised to the dignity of duke of Northumberland. Near Braxton was fought the celebrated battle of Flodden, in which James IV. of Scotland was slain with the flower of his nobility; and at Newburn the army of king Charles I. sustained a complete overthrow from the Scots under the command of general Lesley, who soon after besieged and took the town of Newcastle, though bravely defended by sir John Morley, the mayor.

In former times the lands of Northumberland were held of the king by knights' service. The barons and people of higher condition dwelt in castellated mansions, or moated towers. The middling classes of the people held their lands of the barons chiefly in socage tenure, and resided in buildings called peels or piles, consisting of a ground floor, in which their cattle were kept during the night, with a floor above, occupied by the family. The lower orders, in common with the middle class, were subject to the grievous service of keeping night-watches at all the fords, passes, and inlets of the vallies, to guard against the incursions of the borderers, or of the Scots, during hostilities. When either a troop of banditti, or an enemy, made their appearance, every man within hearing of the horn was bound, under pain of death, to rise and assist in the protection of the country. In this state of things, as may be supposed, the occupations of peaceful life were little attended to. Agriculture was suffered to languish, and every art, but the art of war, was esteemed mean and dishonourable. Fortunately the events of the two last centuries have materially altered this dreadful aspect of human life. Since the union of Scotland and England those scenes of contention and barbarism, which rendered existence and property equally precarious, have been gradually disappearing. The country has been inclosed far up the vallies of Tindale and Reedsdale, and the refinements of civilization, and the social and enchanting harmony of rural life now prevail, where, before that happy event, scarcely a sound was heard, but the "warder's tread," or the agonized screams of the widow and the fatherless, whose kind protector lay weltering in his blood, while the flames devoured their little cottage, and left them no shelter from the rude blast of the pitiless winter.

General Aspect, Soil, and Climate.—The aspect of Northumberland displays as much variation as that of any other county in England. Along the sea-coast the land is, for the most part, a perfect level. Towards the middle the surface is more diversified, and thrown into large swelling ridges. These parts are well inclosed, and, in some spots, enriched with woods and plantations. The western and northern districts of the county, with the exception of a few intervening vales, may be characterised as an extensive scene of open, mountainous country, where the hand of cultivation can rarely be discovered. Of these districts, that towards the

north is the most valuable, exhibiting in general a series of fine green hills, thrown into numberless combinations of forms, and inclosing and sheltering many deep, narrow, and sequestered glens. The more southern division, on the other hand, is not marked by any striking irregularities of surface, but, like the Highwolds of Yorkshire, presents a range of widely extended solitary wastes, producing little else but heath, and scarcely affording subsistence to the few flocks of sheep by which they are depastured. With respect to soil, it may be observed, that a strong, fertile, clayey loam covers the level tract along the shore. This soil is admirably adapted for the culture of any species of grain. A sandy, gravelly, and dry loam, is chiefly apparent in those vallies which are watered by rivers; but particularly in the vales of Breamish, Till, and Beaumont, and on the outskirts of the Cheviot mountains. In the middle and south-east parts of the county, a wet, cold, clayey bottom is found to exist throughout a great extent of country; and in most of the mountainous districts black peat earth is more abundant than any other kind of soil. The climate is as changeable as the nature of the country is various. Upon the mountains snow sometimes lies for several months in considerable depth, though there is none in the vallies, or lower districts. The weather is extremely inconstant, but mostly runs in extremes. In the spring dry easterly winds are very prevalent, and continue late; so that summer seldom commences till near the close of June, when milder breezes from the south pour in their life-inspiring balm, and quicken the drooping plants into vigorous vegetation. Hence the autumn of the year is properly the summer of Northumberland. The months of September and October are usually fine settled weather, but no sooner has November begun, than winter sets in with the utmost keenness and severity.

Agriculture.—In a country exhibiting such diversity of surface and climate, as has been mentioned above, a corresponding difference of produce and management may be expected to prevail. Wheat is seldom raised, except on the lands near the shore. Drilling has been introduced, and is practised to a considerable extent. The manures in use are chiefly the produce of the sheep-fold in the higher districts, and lime, marle, and sea-weed in the lower. A large quantity of manure is likewise brought from London, as ballast, in the coal vessels. Great attention is paid to rearing stock. The favourite and almost exclusive breed of cattle is the short-horned, or Dutch kind; and this preference is given in consequence of the superior rapidity of their growth. The Devonshire kind is only in the possession of one proprietor; and in Chillingham park, belonging to the earl of Tankerville, is a stock of wild cattle, probably the only remains of the true and genuine breed of that species in Great Britain. Their colour is invariably white, muzzle black, with small tips of red behind the ears. The horns partake of the same colour as the body, and are tipped with black. Some of the bulls have a thin, upright mane, about an inch and a half, or two inches, long. On the first appearance of a stranger, these animals gallop off at full speed to a considerable distance, then wheeling round, they come up boldly again, tossing their heads in a menacing manner. On a sudden they make a full stop, and again fly off. This they repeat several times, approaching nearer and nearer every return, till they come within a few yards, when it is usually thought prudent to leave them. When the cows calve, they hide their offspring in some sequestered spot, and go and suckle them two or three times a day. If any person approaches a calf so situated, it claps down its head close to the ground, and lies, like a hare, in a form to conceal itself, and should he be seen to touch it, by the mother, he may rely upon

upon being instantly attacked by the whole herd. Such of them as may happen to be wounded, or grown weak and feeble through age or sickness, are set upon by the rest, and gored to death. (See Bewick's History of Quadrupeds.) The sheep of Northumberland are of three sorts, the Cheviot-sheep, the heath-sheep, and the long-woolled sheep. Of these the Cheviot breed is the most remarkable for its beauty; the second sort are peculiarly adapted to the bleak and heathy districts; the third kind have the advantage of fattening at an early age, and producing great quantities of good wool.

The tythes of this county offer no peculiar feature, except that the tythes of hay and corn, being for the most part in the hands of opulent laymen, renders commutation for money less practised than it otherwise might be. The annual value of estates rises from the smallest sum to upwards of 30,000*l.* One estate only is said to yield more than 80,000*l.* a-year. In the mountains, especially near the sources of the Tyne, there are several small estates from thirty pounds to three hundred a-year, farmed by their proprietors, and as these have generally been handed down through several generations, a strong attachment to ancient methods of husbandry have defended with them, and improvements have been slowly adopted. The largest farms are those in Glendale and Bamborough wards; and some tenants in the northern parts of the county rent from 2000*l.* to 4000*l.* *per annum*. Dry loams let for fifty, or fifty-five shillings *per acre*, and the old rich grazing pastures for sixty or seventy shillings, tythe free. All the rents are paid in money, and four or five months credit is usually given to the farmers; many of whom are deservedly held in high estimation for their agricultural skill, and by their liberal and scientific views have contributed to exalt their profession to a high point in the scale of practical science.

The rivers of Northumberland are numerous, and spread, by a great variety of branches, throughout almost every part of the county. The principal of them are the Tyne, the Tweed, the Blythe, the Wanbeck, the Cocquet, the Aln, and the Till. The Tyne rises from two sources, one behind Crofs Fell, and another on the borders of Scotland, which, till the junction of their streams, are denominated the North and South Tyne. This river was formerly celebrated for its salmon fisheries; but these are now entirely destroyed. It is still, however, of high importance in a commercial view, being navigable for vessels of large burden far above Newcastle, which is one of the first trading towns on the eastern coast of our island. The conservatorship of the Tyne is vested in the mayor and corporation of Newcastle, whose jurisdiction extends to high water mark, on both sides of the river from the sea to Hedwin streams, above Newburn, which distance is surveyed annually on Ascension day. The Tweed divides England from Scotland, and consequently forms the northern boundary of the county. It rises at a place called Tweed's Crofs in Tweedale, and receives, in its progress through North Britain, three rivers, much celebrated in song, the Ettrick, the Leader, and the Tiviot. The annual rental of the salmon fisheries on this river amounts to the enormous sum of 15,766*l.*; and the yearly value of the salmon fold is estimated at 60,000*l.* Near the mouth of the river, a rent of 800*l.* *per annum* is paid for a fishery not exceeding two hundred yards in length. (See SALMON, also BERWICK-upon-Tweed.) The Blythe and Aln both fall into the German ocean, and form estuaries which are navigable for a short distance, and hence are extremely convenient for the exportation of coal. The Cocquet pours its waters into the sea near Warkworth, where there is a fishery for salmon-trout and gillie. By a recent alteration in its channel, this

river seems to be preparing itself for being an excellent harbour for small vessels. The Wanbeck is the most noted of any stream in the county for the beauty of its banks; and is immortalized by Akenfide in his Pleasures of Imagination. The Till, rising among the Cheviot hills, is called Brennich as far down as Wooler. This river, after being joined by the united currents of the Bovent and Glen, falls into the Tweed. The Bovent is remarkable for fine pebbles.

Mineralogy.—In a mineralogical estimate, Northumberland is a county of distinguished importance. Lead-ore is found in great abundance, particularly in its western parts. Allendale mines have been wrought for time immemorial, and at present afford an annual produce of about 12,000 bings of ore, which is smelted and refined at Dukefield, and yields seven or eight ounces of silver for each fother of lead. The ores here have the calcareous or fluor-spar for their matrix, and the sides of the mines are often richly decorated with pellucid and polished crystals of various minerals; but never shew so much magnificence and glory as when they are interspersed with yellow ore of copper, and with pyrites and black jack, which, in hard veins, display a combination of the most beautiful colours nature or imagination can depict. The other lead-mines are at Shilden, near Corbridge, and at Little Houghton, in the vicinity of Bamborough. Indications of the same metal also appear near Simonburn, and in different places south of the Tyne. There likewise have been mines in Rothbury forest, and at Newborough; and ore is obtained in considerable quantities at Fallow-Field, but the small quantity of silver it contains is not equal to the necessary expence of smelting it. Zinc abounds in most of the lead-veins, and iron-stone lies imbedded in vast quantities in the strata of indurated clay, throughout the whole of the coal district, which is computed to extend (including a small portion of Durham) 20 miles in length, and 15 in breadth, being an area of 300 square miles. The caking-coal is found in the greatest abundance, and of the best quality, in that range of country lying between a line drawn from Alnemouth to Tinemouth; from thence, by the south boundary of the county, into the parish of Bywell; and again from Bywell to Alnemouth. This district, as far as it has been examined, is found to consist of various kinds of silicious stone, schistus, and coal. Beds of schistus usually constitute the matrix of the coal-seams, both above and below, and frequently exhibit beautiful impressions of fossil plants, as ferns, vetches, ears of barley, &c. and, what is remarkable, pine-apple leaves. Layers of iron-stone are frequent in these beds, generally of a rhomboidal form, but sometimes in nodules. At Kenton, in particular, are discovered immense fossilated trees, some of which have been hewn into seats, and shew the yearly rings of their growth, and also the roughness of the bark. The strata of Northumberland usually dip or incline towards the east; and each stratum keeps its parallelism, with respect to those immediately over or under it, through all the confusion of the perpendicular rents and chasms, which are denominated by miners dikes, slips, hitches, and troubles. Some of these chasms are filled up with clay, sand, and round stones, which have dropped in from the surface, according to the opinion maintained by Werner in his late work on the formation of mineral veins. Many of them are the receptacles of metals and beautiful spars; and others of basalt, a substance bearing a near resemblance to lava, and hence supposed to have been thrown up in a fused state from the internal cavities of the earth, and to afford an apologetic illustration of the Huttonian theory. A basalt dyke, thus formed in the coal-mine at Walker, is cased with the cinders of coals; but in what manner this phenomenon has occurred,

occurred, it is not easy to determine. The great operations of nature in the economy of the globe are yet but imperfectly known; and perhaps, in the present state of the science on which their explanation peculiarly depends, cannot be investigated with any prospect of attaining a correct solution: nor indeed do we conceive that it ever will be possible to establish their theory upon the same demonstrative evidence, by which Newton and La Place have been enabled to explain the complicated, but uniform, movements of the heavenly bodies. Chemistry is a science only admitting of the partial application of geometry, or the calculus; and therefore, of necessity, many of its theoretical conclusions must continue to rest on a species of moral evidence alone. As far, however, as the human mind can reach in the pursuit of truth, abstractedly from mathematical accuracy, we are hardy enough to think that geologists may one day carry the decision of the curious and interesting question, which now divides the chemical philosophers of Europe.

Besides the minerals already mentioned, several others of inferior importance are discovered in Northumberland. Lime-stone, of an excellent quality, abounds in almost all parts of the county, except in the coal district, the boundaries of which have been described, and in the porphyry tract of the Cheviot hills. Stone-marle is plentiful in many places near the Tweed, and shell-marle is found in a few places in Glendale Ward, principally at Wark, Sunnyslaws, and Learmouth, where it has been formed by a deposit of various kinds of shells, both univalve and bivalve, many of which are still perfect, and form a stratum, several feet in depth, of fine calcareous earth. In the centre of this bed of marle is a horizontal stratum of sand, about twelve inches thick, certainly a matter of curious speculation to the natural historian. Some years ago, a red flag, in the attitude of running, and entire, was dug up here; as well as the scalp and horns of some animal of the *bos taurus* species, being more than twice the dimensions of the horns of any ox or cow of the present day, an inhabitant of this island.

Roads and Canals.—The turnpike roads in this county are mostly in good order, but have one material defect, which is, that they are frequently disgraced with steep banks, when a trivial alteration of the line would have thrown them on a level. This remark is peculiarly applicable to both the roads passing over Rimside-Moor, and to the great post-road, which ascends and descends a great number of hills, without even the plea of being nearer, as the leveller track would have been shorter, travelled in less time, and with far less fatigue. Of the township roads, some are good, but by much the larger proportion are extremely bad. As to canals, it is to be remarked, that though frequently planned, and even the necessary fund raised for their execution, not one has hitherto been put in actual progress.

Manufactures and Commerce.—Northumberland cannot be said to possess any decided staple manufacture. Many arts, notwithstanding, are practised here upon a large scale; the principal of them, as may be supposed from what has been stated, being derived from, or connected with, the coal trade and mines, as ship-building, roperies, forges, founderies, copperas, coal-tar, soda or marine alkali, white lead, potteries, glass works, and a variety of others which it seems unnecessary to mention. Hexham has been long noted for its manufacture of gloves, which employs about 300 persons. Small manufactures of woollens are likewise established at Alnwick, Mitford, and Acklington, and cotton-mills have been lately erected at Nether-Witton. The commerce of the county consists in the exportation of all the

articles it produces in any considerable quantity, and particularly in the exportation of coal, of which 12,493,707 tons were exported from the Tyne only, in eight years, from January 1st, 1802, to December 30th, 1809. The imports embrace almost every article of necessity, convenience, or luxury, not supplied within its own boundaries. Newcastle, Berwick, and Alnemouth are the chief seaports; but numerous smaller harbours are dispersed along the coast, and also on the banks of the navigable rivers.

Political and Ecclesiastical Divisions and Government.—Northumberland is politically divided into six wards, and six hundred and thirty-five constabularies. The names of the wards are Tindale, Morpeth, Cattle, Glendale, Balmbo-rough, and Cocquetdale; which contain the following borough and market-towns: Newcastle-upon-Tyne, Berwick-upon-Tweed, Alnwick, Bamburgh, Corbridge, Belford, Hallwhittle, Haydon-bridge, Bellingham, Hexham, Morpeth, North Shields, Ovingham, Rothbury, Stamfordham, Warkworth, and Wooley. It sends eight members to the national council, *viz.* two knights of the shire for the county, and two representatives for each of the three boroughs of Newcastle, Morpeth, and Berwick. The balance between the aristocracy and the popular party in the county is nearly equal, the interest of the duke of Northumberland returning one member, and the independent gentlemen and yeomen another. The church divisions are into five deaneries, Newcastle, Corbridge, Bamburgh, Alnwick, and Morpeth, and seventy-three parishes, including those of Bedlington, Berwick, Holy Island, and Norham, which, though within the confines of Northumberland, are under the civil jurisdiction of the courts of Durham. All the deaneries are within the archdeaconry of Northumberland, diocese of Durham, and province of York. The churches of Hexham, Allendale, and Johnlee, with their respective chapels, are peculiar of the metropolitan see; and Throckington is a peculiar in the advowson of the dean and chapter of York cathedral.

Population.—According to the parliamentary returns of 1801, this county, with Berwick-upon-Tweed, comprised 28,052 houses, 35,503 families, and 157,101 persons, of whom 73,357 were males, and 83,744 females. By the same estimate, 25,738 persons were reported as employed in trade and manufactures, and 23,190 in agriculture. From the late returns (1811), a considerable increase appears to have taken place. These state the houses at 29,552, the families at 37,743, and the individuals at 172,161 in number, *viz.* 80,385 males, and 91,776 females. The families engaged in trade are computed to amount to 16,547, and those employed in agriculture to 10,945.

Antiquities form the only remaining subject which it seems requisite to notice in this article; and it may be justly said that few districts of the same extent offer a more fertile, or a more interesting field for the gratification of antiquarian curiosity.

Having been situated on the confines first of Roman Britain, and afterwards of the English monarchy, Northumberland, probably, exhibits more vestiges of military art than any other portion of our island. The wall of Severus, and Hadrian's vallum, pass through the southern part of this county, and are lasting monuments of Roman industry and of Caledonian valour. Hadrian's rampart consists of a principal agger or mound of earth, thirty feet broad at the base and ten feet high, and a ditch, ten feet deep and fifteen feet wide; a second mound, three feet high, and six feet in breadth at the base; another ditch, twelve feet deep and twenty-four over, besides a third agger, situated about seventy feet from the rest of the work, measuring thirty feet broad at the base, and ten feet high. All these valla are of semicircular form,

and, as well as the ditches, constantly run parallel to each other. They are composed of turf, stones, and earth thrown up loosely together, and the whole work extends from near the mouth of the Tyne, entirely across the island to the Solway Frith. The wall of Severus is situated only at a short distance from this rampart, and appears to have been built of stone, sometimes formed on oak piles, and was in its original state from seven feet, to seven feet four inches, broad at the foundation. This wall reached beyond the vallum of Hadrian, keeping a constant parallelism with that work, and was defended at short intervals by strong towers, all of which, except one near Harlow-hill, are mentioned by Gough as being sixty-six feet square, the wall itself constituting the northern side of each. Besides these posts on the wall, the Romans had various stations dispersed through the county, of which *Bremenium*, *Habitancum*, and *Corstopium* were the principal. *Bremenium*, indeed, was a Roman stipendiary city of primary importance, having been, as already mentioned, the chief town of the *Ottadini* before the arrival of these mighty conquerors. This place is situated on the Watling-street, as well as *Habitancum* and *Corstopium*, and still retains strong marks of its ancient consequence. It is defended by three ramparts of earth, and a wall seven feet thick, fancifully chequered with ashlar work of different colours. Here was formerly a hypocaust, which has been described by Hutchinson; and many vestiges of antiquity, such as urns, inscribed stones, &c. have been frequently dug from the ruins. But such relics, it may be remarked, abound in almost every part of the county; and are by far too numerous to admit of even a general notice, much less a particular description, in an article like the present. The same thing may be said with respect to the castellated mansions and religious structures of later erection, the bare enumeration of which would occupy a volume of considerable magnitude. Several of these, however, will be found mentioned under the names of the borough or market-towns at or near which they may happen to have been placed. Some Druidical circles are likewise seen in this county, also crosses, cairns, and other minor monuments of the contests and illustrious deeds of our brave though ferocious ancestors.

The encampments here are of every form and size in which they are discovered in Great Britain; some of them, doubtless, British and Roman, and others of the Saxons, Danes, Normans, and English, and not unlikely successively altered and occupied, after their original construction, by the armies of one or more of the succeeding nations, who spread their dominion over England. The Roman roads in Northumberland are numerous. One road accompanies the Roman barriers throughout their whole extent from east to west. The Maiden-way, called by the country people the Made-way, intersects the western division of the county, reaching from Caervorran to Whitley-castle, and thence to Whilop-castle in Westmoreland. Watling-street enters Northumberland at Eborchester, and crossing the Tyne at Corbridge, divides into two branches at Bewcley, a short distance north from the great wall. One branch passes through Reedfale into Scotland, by Rivingham and Rochester, and the fine encampment at Mackendon: the other branch is usually called the Devil's Causeway. It has at first an easterly direction past Ryal, towards Bolain, whence sweeping northwards over Rimside Moor, it enters Scotland west from Berwick-upon-Tweed. Connected with this road is a paved way from the eastern gate at Rochester, over Boleyard Lees by Hallystone to Sharperston. Near Hallystone it is ten feet wide, and is still very perfect. General View of the Agriculture of Northumberland, by J. Bailey and

G. Culley, 8vo. 3d edit. 1805. The Natural History and Antiquities of Northumberland, &c. 2 vols. 4to. 1767, by John Wallis, A. M. A View of Northumberland, by William Hutchinson, 2 vols. 4to. A Historical and Descriptive View of the County of Northumberland, &c." 2 vols. 8vo. Newcastle edit. 1811. Beauties of England, Northumberland, vol. xii., by the Rev. Mr. Hodgson, 1812.

NORTHUMBERLAND, a town of America, in Grafton county, New Hampshire, situated on the E. side of Connecticut river, at the mouth of the Upper Ammonoosuck; incorporated in 1779, and containing 205 inhabitants.—Also, a county of Pennsylvania, bounded N. by Lycoming; S. and W. by Dauphin and Mifflin counties; divided into 24 townships, and containing 27,797 inhabitants. The chief town is Sunbury.—Also, a flourishing port-town in the fore-mentioned county, situated on the point of land formed by the junction of the N. and W. branches of the Susquehannah; regularly laid out, and containing about 120 houses, a Presbyterian church, and an academy; two miles N. by W. of Sunbury.—Also, a county of Virginia, bounded E. by Chesapeake bay, and W. by Richmond, containing 3900 free inhabitants, and 3903 slaves; 12 miles from Kinfales.—Also, a county in Upper Canada, bounded E. by the county of Hastings, and the portage of the Presq' Isle de Quinte, S. by lake Ontario, until it meets the westernmost point of Little Bay; thence by a line running N. 16° W., until it meets the southern boundary of a tract of land belonging to the Mississauga Indians, and thence along the tract parallel to lake Ontario, until it meets the north-westernmost boundary of the county of Hastings. This county comprehends all the islands near to it in lake Ontario, and the bay of Quinte; and the greater part of it fronts lake Ontario.

NORTHUMBERLAND Islands, a chain of islands in the South Pacific ocean, near the N.E. coast of New Holland, running parallel to the main land, at the distance of five to eight miles; differing in height and size, scarcely one of them being more than 15 miles in circumference, and many not four. S. lat. 21° 28' to 22° 26'. W. long. 209° 50' to 210° 54'.

NORTHUMBERLAND Straits, a narrow channel of the East Indian sea, between the islands of Calamianes and the shoals of Apo.

NORTHWICH, a large and ancient market town, partly in the hundred of Eddisbury, and partly in that of Northwich, in the county of Chester, England, is situated near the conflux of the rivers Dane and Weaver, at the distance of 18 miles from the city of Chester, and 174 miles from London. The streets are irregular and badly paved, and many of the houses are of considerable antiquity. The township of Witton adjoins to Northwich, and is considered as forming part of the town. In the town is a parochial chapel, a spacious edifice, which is remarkable for the peculiarity of its choir, being semicircular; the roof of the nave is adorned with numerous figures of wicker baskets, similar to those used in the manufacture of salt. A grammar school was founded and endowed here in the year 1558, by the Rev. sir John Deane, rector of St. Bartholomew the Great in London. The government of the school is vested in twelve trustees, by whom the master and scholars are appointed. From the central situation of Northwich, the increase of its population, and the extension of the salt trade, this town is become a place of great resort. A very considerable market is held on Fridays; and two fairs annually, which continue nearly a fortnight each, for the sale of Yorkshire and Manchester goods, and for various other commodities. In the return made to parliament in the year 1811, Northwich was stated to contain 324 houses, and 1382 inhabitants.

bitants. The lower classes of the people derive employment from a cotton factory recently established, and from the *salt* trade, which, though carried on to great extent in several parts of this county, is chiefly concentrated in the neighbourhood of Northwich. Here the salt is manufactured not only from the brine springs, but also from the natural rock, a circumstance peculiar to this town and its vicinity: the annual quantity of rock salt delivered from the pits is from 50,000 to 60,000 tons; in addition to which, the brine pits yield a yearly supply of not less than 45,000 tons. See *SALT*.

About four miles from Northwich is Vale Royal abbey, the seat of Thomas Cholmondeley, esq. A monastery of this name was founded here, for Cistercian monks, by prince Edward, afterwards king Edward I. No part of the ancient abbey is now remaining, though some places retain appellations connected with monastic discipline. The hall of the present mansion was erected in the beginning of the seventeenth century; it is nearly seventy feet in length. The wings have been recently rebuilt. The apartments are embellished with numerous portraits, some of which are of distinguished eminence. The library is large and valuable. Lysons' *Magna Britannia*, vol. ii. *Beauties of England*, vol. ii. by J. Britton, and E. W. Brayley.

NORTHWOOD, an interior and elevated township of America, in Rockingham county, New Hampshire, in which, and on its borders, is a number of small ponds, whose waters supply Piscataqua and Suncook rivers; incorporated in 1773, and containing 950 inhabitants; about 39 miles N.W. of Portsmouth. Crystals and crystalline spars are found here.

NORTH YARMOUTH, a port-town of Cumberland county, in the state of Maine, on a small river which falls into Calco bay; 17 miles W. by S. of Brunswick. The township, which is extensive, was incorporated in 1713, and contains 2600 inhabitants. It is divided from Freeport on the N.E. by Cusens river.

NORTON, CHIPPING, a borough and market town in the hundred of Chadlington, and county of Oxford, England, is situated 20 miles distant from the city of Oxford, and 74 miles from London. Its appellation, Chipping, shews it to have been a town of note in the Saxon times, as Ceapan, whence it is derived, signifies a market or place of trade, as all the places appear to have been which have the name of Chipping-prefixed. The town is incorporated, and the government is vested in two bailiffs and twelve burgesses, who are empowered by charter from James I. to hold a court and determine all actions under 4*l*. The church is a spacious edifice, being 98 feet long and 87 broad, and the middle aisle 46 feet in height. Here is a free grammar school, which was founded by king Edward VI. In the enumeration made pursuant to act of parliament in 1811, Chipping-Norton is stated to contain 383 houses, occupied by 1975 persons. Six annual fairs are held, and a weekly market on Wednesday. Two burgesses were sent to parliament in the 30th year of Edward I., and also in the 32d and 33d years of Edward III., since which period no return has been made.

About three miles from Chipping-Norton is an ancient monument, called the Rowldrich, or the Roll-rich-stones, standing in nearly a circular form, the diameter from north to south being 35 yards, and from east to west 33 yards. The stones appear to have been originally sixty in number; at present twenty-two are standing, few exceeding four feet in height, and sixteen inches thick, except one in the very north point, which is seven feet high, and five feet and a half broad; eighty-four yards north-east from the circle, is a

large stone called the King-stone, eight feet in height, seven feet in breadth, and about twelve inches in thickness. Camden thinks this monument to be a memorial of some victory, perhaps erected by Rollo the Dane, who invaded England in 816. But Dr. Stukeley ascribes it to the Druids; as Rholdrwg, he says, signifies the *circle* or *church* of the Druids. To the same origin he attributes the several barrows contiguous to this spot, one of which is sixty feet long, and twenty broad. Mr. Gough considered the doctor's opinion as carrying more probability with it than the crude conjectures of earlier writers. Gough's *Camden*, vol. i.

NORTON, a township of America, in Bristol county, Massachusetts; 33 miles S. of Boston; incorporated in 1711, and containing 1481 inhabitants. Here are manufactures of nails and of ochre.—Also, a settlement on the N.E. coast of Cape Breton island.—Also, a town of South Carolina; 22 miles S.S.E. of Columbia.

NORTON Sound, a large bay on the N.W. coast of North America, discovered by Capt. Cook in 1778, and so called in honour of sir Fletcher Norton, afterwards baron Grantley. This bay extends to the northward as far as N. lat. 64° 55'. The people adjoining to this bay did not appear to our navigators to differ, either as to their size or features, from those whom they had found on every other part of the coast, King George's sound (Nootka) excepted. Their clothing, which consisted principally of deer skins, was made after the same fashion; and they observed the custom of boring their under lips, and fixing ornaments to them. Their dwellings consisted of a sloping roof, without any side walls, composed of logs, and covered with grass and earth; the floor was laid with logs, the entrance being at one end; the fire-place just within it; and a small hole was made near the door to let out the smoke. Brooms and spruce, and also fish, were obtained in exchange for knives, beads, and other trifles; but the article chiefly valued was iron. The berries which were procured here were wild currant berries, huckle berries, partridge berries, and heath berries. From the elevated spot on which Mr. King surveyed the sound, he could distinguish many extensive valleys, with rivers running through them, well wooded, and bounded by hills of a gentle ascent and moderate height. One of these rivers, which runs to the N.W., appeared to be considerable, and to empty itself into the sea at the head of the bay. The trees were found to be larger by those who advanced from the bay farther into the country. The bay in which our navigators anchored, lay on the S.E. side of it, and was called by the natives "Chacktoole." The station was indifferent, being exposed to the S. and S.W. winds; nor is there a harbour in all the sound. From 77 sets of lunar observations, the longitude of the anchoring place, on the W. side of the sound, was found to be 197° 13'. Lat. 64° 31'. Variation of the compass 25° 45' E. Dip of the needle 76° 25'. The night-flood rose almost two or three feet; and the day-flood was hardly perceivable. Cooke's *Third Voyage*, vol. ii.

NORVI, a town of the island of Sardinia; 16 miles N.E. of Sassari.

NORUM, a town of Sweden, in West Gothland; 20 miles S. of Uddevalla.

NORUNGAH, a town of Hindoostan, in Bahar; 33 miles W. of Gayah.

NORWALK, a pleasant port-town of America, in Fairfield county, Connecticut, on the N. side of Long Island sound, containing a Congregational and Episcopal church, and between 40 and 50 compact houses; 13 miles W. by S. from Fairfield. The township, which was settled in 1651, is situated in a fertile wheat country. It has iron works, and a number of mills; it carries on a small trade to

New

NORWAY.

New York and the West Indies, and contains 5146 inhabitants.

NORWALK Islands, a cluster of small islands in Long Island sound, near the coast of Connecticut. N. lat. $41^{\circ} 4'$. W. long. $72^{\circ} 22'$.

NORWAY, anciently *Norrik*, or the *Northern kingdom*, a country of Europe, anciently an independent kingdom, but for many years subject to Denmark; bounded on the S. by the entrance from the Baltic, called the Scaggerac, or Categate, on the W. and N. by the northern sea, and on the E. by a long chain of mountains under different names, which separates it from Sweden. Its extent and dimensions have not been precisely ascertained. Geographers have differed about its limits northward, and, therefore, some have made its length 1100 miles, and others have stated it at 750 miles, its breadth at 170, and its area in square miles 71,400. Its capital has been either *Bergen* or *Christiana*, which see. Norway is formed by nature into two great divisions, *viz.* Northern, and Southern or Proper Norway, separated from each other by the small Swedish province of Herndahl. *Northern Norway* is a long and narrow slip of land, extending as far as North Cape, beyond the 71st degree of latitude, the most northern point of Europe; it is divided into Nordland and Finmark, and comprehended in the government of Drontheim. *Southern or Proper Norway* is bounded as we have already stated, and is divided into four dioceses or governments, *viz.* Aggerhuus or Christiania, Christianland, Bergen, and Drontheim, which see respectively. Although Norway comprehends a large tract of territory; yet, on account of its rocky soil and unfavourable climate, the number of inhabitants does not correspond to the extent of the country. The amount of its population is estimated at 700,000, or 750,000 souls. The Norwegians being the same race with the Danes, and long connected with them in religion and government, speak the same language, which is a dialect of the Gothic, intermixed with some provincial expressions. In their disposition and manners, they occupy a kind of middle place between the simplicity of the Greenlanders and Icelanders, and the more polished state of the Danes. They are in general robust and brave, but irritable and resentful; the women are handsome and courteous; and the Norwegian forms, both of living and of enjoying property, are mild, and much resemble that of the Saxon ancestors of the present English. Every inhabitant is an artisan, and supplies his family with all necessaries from his own manufactures; so that in Norway there are few, who by profession are hatters, shoemakers, taylor, tanners, weavers, carpenters, smiths, and joiners.

Every peasant, few excepted, in Norway breathes the air of freedom. This freedom they derive from a particular code, called the "Norway law," compiled by Grieffelsfeld, at the command of Christian V., the great legislator of his country. By this law, the palladium of Norway, liberty is extended to all peasants, except a few who belong to certain noble estates near Frederickstadt. And even to these serfs the spirit of the same law communicates its influence; for no proprietor can have more than one of these privileged estates, and unless he possesses a title or certain rank, and resides on his estate, he loses his privilege, and the peasants become free. The benefits of this code, says Mr. Coxe, are so visible in its general effects on the happiness and in the appearance of the peasants, that a traveller must be blind, who does not perceive the difference between the free peasants of Norway, and the enslaved vassals of Denmark, previously to their emancipation, though both living under the same government. Many of the peasants derive their lineage from the ancient nobles, and some

even from the royal line; on this supposed descent they much pride themselves, and are careful not to give their children in marriage but to their equals in birth and blood. For the custom prevalent in Norway, favourable to the peasants, called "Odel's" or "Odhel" *right*, see that article. The Norwegian peasants, says the author now cited, possess much spirit and fire in their manner; they are frank and undaunted, but not insolent; never fawning on their superiors, and yet paying proper respect to those above them. Their principal mode of salute is by offering their hand, and they return thanks for a favour, not by words or a bow, but by shaking hands with great frankness and cordiality. The peasants are well clothed and well lodged, and apparently possess more comforts than any except the Swifs. They weave their ordinary cloth and linen, and manufacture a kind of stuff like Scotch plaid. The coats of the men are principally made of a stone-coloured cloth, ornamented with rich button-holes and metal buttons. The women, when employed in their household affairs, frequently appear only in a petticoat and shift, with a collar reaching to the throat and a sash tied round the waist. Their linen is very fine, and displays the figure to the highest advantage. Although their dress is in many respects accommodated to their climate, yet custom enables them to outbrave the inclemency of the weather; for they expose themselves to cold without any covering on their breasts or necks. The Norwegians maintain their strength and ability for labour, in many instances, to an advanced age. The common food of the peasant is milk, cheese, dried and salted fish, and sometimes, but rarely, flesh or dried meat, oatmeal called "flad brod," baked in small cakes like pancakes, usually made twice a-year. In times of scarcity they also use the bark of trees, generally of the fir, which is dried and pulverised, mixed with oatmeal, baked and eaten like bread. As a luxury, the peasants eat "sharke," or thin slices of meat sprinkled with salt, and dried in the wind, like hung beef; also a soup made like hafty-pudding of oat-meal, or barley-meal, which is rendering palatable, by adding a pickled herring or salted mackerel. The use of potatoes has been lately introduced, though they do not grow to any size in a country where the summer is so short: Fabricius strongly recommends, in times of scarcity, the mosses and lichens, and particularly the "lichen islandicus," which yields a nourishing sustenance, and is commonly used for food in Iceland.

The Norwegians maintain their own army, which consists of 24,000 infantry and 6000 cavalry. The troops are much esteemed for their bravery, and like the Swifs mountaineers, exceedingly attached to their country. The horses, which supply the cavalry, are small, but strong, active, and hardy. Every peasant, not born in a town, or on some noble estate, and those on the coast, who are classed as sailors, excepted, is by birth a soldier, and enrolled at the age of sixteen. From that year he continues to serve until he arrives at thirty-six, when he receives his discharge. The militia take the field every year in June, and remain encamped about a month. Norway can furnish about 14,000 excellent seamen. This country contributes to the annual revenue about 290,000*l*.

As to the climate of Norway, it varies according to its extent, and its position towards the sea. Extending along the west side of the Scandinavian Alps, and exposed to the vapours from the Atlantic, it is not so cold as we might be naturally led to imagine. If we compare the climate of Norway, with that of London, March in London is like April and the beginning of May in Norway, and the March of Norway is our January. On account of the frequent spring

spring frosts, seeds ought not to be sown in gardens before the 20th of May, and the frosts of the latter end of August are no less detrimental. The heat and cold vary so much in Norway, that in June or July the mercury in Fahrenheit's thermometer not unusually rises at Sydeborg to 88, and on the 1st of January 1782 fell to -22 , or 54° below the freezing point. At Eger it fell on the same day to $-36\frac{1}{2}$, and at Kongsberg to -40 , or 72 below the freezing point, a degree of cold by which quicksilver is congealed. This extreme rise and fall of the mercury makes a difference of 110° between the greatest heat and greatest cold at the same place; and this difference is much more considerable than that at Upsal or Stockholm, which lie nearly in the same latitude as Sydeborg. In some places vegetation is so quick, that corn is sown and cut in six or seven weeks. Tillage cannot be supposed to flourish in a country so rocky as in many parts to defy the plough, and where the climate is so severe that the hoar-frosts begin in September, and the cold in the highlands prevents the maturity of the corn. The small valleys and the intervals between the rocks are usually provided with a fruitful soil, and the industry of the peasants covers the naked rocks and sandy grounds with a new earth; yet the arable grounds are few, and no parts of Norway yield sufficient corn for interior consumption, except the districts of Hademark, Foten, and Ringerike. Many other circumstances counteract the industry of the farmer; so that in the most favourable seasons, a considerable importation of corn is annually necessary; but in unfavourable harvests the utmost dearth is experienced in the inland parts, as the transport of the corn from the sea-coast is very expensive. In order to dry the corn exposed to heavy rains, the peasants fix in the ground forked poles ten feet high, on which they pile the sheaves, the lowermost row hanging about two feet from the ground. They are also frequently obliged to bake the corn in wooden sheds, heated by means of stoves.

Norway, however deficient in arable land, is very rich in pasture, and abounds in cattle. The mode of keeping cows resembles that of Switzerland. About the middle of May they are turned into meadows; towards the middle of June driven to the heights, or to the forests, where they continue till autumn. The cows are usually tended by a woman, who inhabits a small hut, milks them twice a day, and makes butter and cheese on the spot. On their return the cattle are again pastured in the meadows, until the snow sets in about the middle of October, when they are removed to the stables, and fed during winter with four-fifths of straw and one-fifth of hay. The horses are usually foddered with hay during the winter, and are seldom sent to graze before the beginning of June. In some places the cattle are fed with salted fish.

Of late years agriculture has been improved in Norway, and of course the value of estates has risen nearly one-third. This melioration is principally owing to the exertions and encouragement of the Patriotic Society, which gives premiums for the best improvements and instructions in every part of farming.

The fisheries, particularly on the western coast, furnish to the natives employment and wealth, and are the means of supplying the best seamen for manning the Danish fleet in times of war. The principal fish, which, when dried and salted, supply a very considerable article of exportation, are the cod, the ling, and the whiting; and besides, the livers yield train oil, and the smallest fish serve as fodder for the cattle. The herring fishery has lately been deprediated in value, as the shoals, which used to frequent the coast of Norway, in their progress from the North pole, keep at a

greater distance from the shore, and thus by first approaching the rocks of Maestrand and Stroemstrand, the chief herring fishery has been transferred to the Swedes. Salmon is taken partly in the bays, and partly in the rivers, as they ascend the stream in spring for the purpose of spawning, and is cured by salting and smoking. Against mackerel the Norwegians have conceived a prejudice from a strange notion, that shoals of this fish often attack and devour the human species when bathing in the sea.

Norway is almost wholly an alpine country. The mountains of Joglefeld constitute the southern extremity of the grand chain that separates it from Sweden. In proceeding northwards Joglefeld is succeeded by Buglefeld, and Haklefeld. Hardangerfeld forms a more extensive denomination, and detaches a branch towards the S.W. Under the parallel of 61° the chain assumes the name of Filfeld, followed by Sognefeld and Langfeld; which terminates a little beyond the 62d degree of N. lat. The chain now assumes a winding direction from N. to E., and this part, which is esteemed one of the highest, is styled Dofrafeld. After turning to the N.E. we arrive at the parts towards the parallel of Drontheim, which are generally reckoned the most elevated, for towards Lapland the mountains decline in height. The successive names of this central portion are Rudfeld, Shersfeld, and Salafeld. Jornafield and Berrafeld, and some other local appellations, are mentioned by the general name of the mountains of Kolen, which pass along the E. and S. of Danish Lapland.

In a more general point of view, the southern part of the Scandinavian chain, running nearly N. and S. and terminating at the province of Kamsdal, is called "Langfiell," or the long mountains. Hence the part called "Dofrafiell" extends towards the E., ending above the lake of Aursund or Oresund, where it again proceeds almost due N. Hence also a considerable branch proceeds by Swakku, &c. towards Sweden. Swakku, according to Cattean, is 2262 Danish ells (each two feet) above lake Fæmund. Bergman computes its height above the sea to be 9000 feet. The third part of the range from the N. of Oresund and the vicinity of the copper-mines of Roras, is called the chain of "Kolen," extending between Norway and Swedish Lapland, and afterwards bending, in the form of a horse-shoe, on the S. of Finmark. The height of these mountains has been variously estimated. From some late surveys we learn that the highest in the diocese of Drontheim are not more than 600 fathoms above the surface of the sea; that the mountains fall to the western side from the distance of eight or ten Norwegian miles; but to the eastern from that of 40. The highest is Dovre-fiell in Drontheim, and Tille in Bergen. Kinnakalle, in Westrogothia, is only 815 English feet above the lake Wepern, or 931 above the sea. Areskutan, a solitary mountain of Jemmland, about four or five Swedish miles from the highest Alps, which separate Norway and Sweden, is said to be 6162 English feet above the nearest river; Swakust, within the borders of Norway, 4658 above lake Fæmund, and that lake is thought to be 2 or 3000 above the sea; and Sylfiællen, on the borders of Jemmland, is 3132 feet perpendicular from the height to the base. As to the construction of the Norwegian mountains, nothing absolutely certain is known, as they have not been much explored. Some of them consist of sandstone, of the siliceous, argillaceous, or calcareous kind. According to Bergman, many of the mountains of Norway are of pudding-stone, sometimes of quartz pebbles, crufted by a grey micaceous cement. Some are of hornblende slate in which garnets appear. This country abounds with marble, and the lapis ollaris is found in great quantities, so that the cathedral of Drontheim and
other

other edifices were built with it. This is usually found in the vicinity of granite; asbestos and amianthus also indicate granite; and rock-crystals are found of large size and beauty, with talc, garnets, and amethysts. Chalk and flints are unknown. Norway abounds in various metals. Some gold ore was found in 1645 near Arindal; the gold mine of Edfjeld, about 30 miles N. of Christiania, was discovered in 1758, but its produce was inconsiderable: it is on a vein of quartz and pyrites. The silver mines of Kongsberg, about 40 miles S.W. of Christiania, have been long reputed the richest in Europe. According to Bergman's account of them, the rock consists of vertical banks of micaceous schistus, with garnets, lime-stone, and quartz. The richest veins are in those of a greyish quartz mingled with small black mica, and reddish petrosilex; but especially on a fine-grained white quartz, and a little calcareous earth, or where the quartz and mica are in alternatè strata. The ferruginous layers are most productive. These mines of Kongsberg were discovered by the threads of native silver on the rock; and Jars says, that most of the mines now worked were disclosed by the same means. The gangarts are calcareous spar, fluor, and mountain rock; and the native silver is also found in a grey rock (hornblend), which may be regarded as the top and bottom of the mine. The discovery of the mines of Kongsberg was made in 1623 by two peasants, who were diverting themselves with throwing stones; and in consequence of this discovery the town of Kongsberg was founded; which became a flourishing town of 6000 inhabitants. They are wrought by 36 shafts, and used to yield about 70,000*l.* annually, when 4000 men were employed. Norway also possesses other silver mines at Iarlsberg, about 30 miles N.E. of Kongsberg, discovered in 1726, but of small account. The important copper mines of Roras, about 46 miles S.E. of Drontheim, were discovered in 1644. They are in the southern slope, the chain of Dofra. These mines are very productive, and a source of considerable revenue. The copper mines are at Quickne and Selboe, about 50 miles E. of Drontheim, and at other places, as Meldal and Foledal. There are also mines of cobalt at Fossan, which are said to produce a clear annual revenue to the crown of about 35,000*l.* But the iron mines of Norway are the most profitable; they are chiefly situated not far from Arindal, in the province of Christianland, and near Skeen, between Arindal and Kongsberg. Lead appears in the vicinity of Kongsberg; and there are alum works near Christiania. Jade and magnets, and rock-crystals, are also found in Norway, with curious garnets, especially the green.

The Norwegian mountains are generally clothed with pines and firs; and almost the whole country may be regarded as a forest, which supplies Europe with masts and other timber. The timber is applied to several purposes, being exported in large quantities, and used for spars, beams, and planks, for building, as most of the houses in Norway are constructed of wood, for the roads, which, especially in the northern parts, are almost entirely formed of wood, for turpentine, for fencing and inclosing the fields, for fuel, and for manure. The pine or fir, and also the elm, are dried and powdered, and mixed with meal for feeding swine. The birch is used for various purposes; the outer bark is employed for covering the roofs of houses, and the inner is applied like the bark of oak for tanning hides, fishing nets, and sails. It supplies also, by tapping, a kind of wine. The twigs of the birch, as well as the alder and aspen, are given to horses in scarcity of fodder. A decoction of oak-leaves is used by the peasants as a fomentation for the rheumatism.

Norway abounds with lakes and rivers. Many of the former are so large that they appear like inlets of the sea. The most extensive are in the south of Norway. The chief of these are the lakes of Mioss, Rands, Tyri, Ojeren, Or, Kowen, Tonhof, Tind, Huide, Nisser, Kiel, and Syredal. Farther to the N. is the lake of Fæmund, that of Sælbo, and those of Beitstædt and Snaasen. The largest rivers are called Elven or Elben. The chief river of Norway is the Glom or Glomen, full of cataracts and shoals; it springs from the lake of Oresund, and runs nearly S. about 300 miles. Next to this is the Dramme, which flows into the bay of Christiania, not to mention the Louwen, the Torrisfals which runs by Christiansand, and others flowing from numerous lakes. Among the quadrupeds of Norway we may reckon its horses, which are small, cows, sheep, goats, swine, dogs, cats, deer, roebucks, hares, rabbits, rein-deer, bears, elks, wolves, lynxes, foxes, gluttons, martins, squirrels, badgers, otters, ermines, beavers, porcupines, moles, rats, and mice. Of its birds we shall mention only the elk or razor-bill, peculiar to this country, and useful on account of its feathers, and the eider-duck, valued also for its feathers. It has great variety of fish. See KRAKEN.

The general exports of Norway are tallow, butter, salt, dried fish, timber and planks, horses and horned cattle, silver, alum, Prussian blue, copper, and iron. The number of ships above 10 *lasts* belonging to Norway, in the year 1799, was 747. The religion of this country is the Lutheran; and its bishoprics are four. (See DENMARK.) The Norwegian coast presents one continued series of small and unimportant islands, most of which are uninhabited; among these we may name Karm, Bommel, Jartar, Hitteren, and others at the entrance of the gulf of Drontheim, the Vikten or Vikton islands; and those of Loffodee, noted for the whirlpool of Malfrom. For many years the Norwegians held the isles of Orkney and Shetland.

Norway, as we have already said, was formerly an independent kingdom, and governed by its own hereditary sovereigns. Its original population consists of Fins and Laplanders; and its sovereignty, originally founded in the S.E. part of Norway, around the modern city of Christiania, was gradually extended, and Harold Harfagre, about A. D. 910, became master of all Norway. In the reign of Olaf I. Norway and Zealand were converted to Christianity. On the demise of Hagen or Haken V. in 1319, without male issue, his grandson in the female line, Magnus Smok, united the kingdoms of Sweden and Norway. Magnus succeeded on the throne of Norway by his son Hagen or Haken VI., who married Margaret, daughter of Waldemar III., king of Denmark, A. D. 1363; and in consequence of this marriage the three crowns of the north were united. On the death of her son Olaf V. Margaret ascended the throne of Denmark and Norway in 1387, and that of Sweden in 1389. On her death the crown descended to her husband, as some say, or according to others, to her nephew, Eric of Pomernia. Sweden was afterwards separated from Denmark by the valour and address of Gustavus Vasa; but Norway has continued united to the crown of Denmark. Coxe. Pinkerton. See DENMARK and SWEDEN.

NORWAY, a township of New York, in Herkemer county, incorporated in 1792, and containing 1911 inhabitants.—Also, a post-town in Cumberland county, Maine, incorporated in 1797, having 609 inhabitants.

NORWAY Rat, in *Zoology*. See Mus.

NORWICH, in *Geography*, a city of Norfolk, England, is distinguished in the commercial annals of Great Britain for its manufactures, and in the topographical his-

tory of the island for the memorable events that have occurred here, for its numerous antiquities, and for various other objects, which we are about to investigate and explain. The city chiefly occupies the top and sides of a gentle hill, which runs parallel with the river Wensum on its western side, and terminates at a sudden bend of it. At this turn, and near that termination, a castle, or military station, appears to have been established at an early period, and as the people congregated round it for personal security, or private advantage, they gradually formed and augmented the town. Of Norwich, in its present state, it has been said that it stands upon more ground, comparatively with its population, than any city in the kingdom, the buildings being generally interspersed with gardens, which latter circumstance has given rise to its appellation of a "city in an orchard." The shape, or plan, is irregular, approaching that of a cornucopia, or bent cone; and has not unaptly been compared to the figure of a shoulder of venison. It is rather more than one mile and a half in length, from Conisford gate, in King-street on the south, to Magdalen gate on the north; and one mile and a quarter broad, from Bishop's gate on the east, to St. Benedict's gate in the west.

Besides the cathedral, it contains thirty-six churches, and several chapels or meeting-houses of various denominations: it has five bridges over the river, one of iron and four of stone. The whole city was formerly surrounded, except on the side towards the river, by an embattled wall, flanked with forty towers, and had twelve gates; the former is dilapidated, and the latter have been taken down.

Historical Events.—The original foundation of Norwich is easily to be ascertained. Soon after the Romans established themselves in Britain, they either erected fortresses near the British towns, or invited the subdued natives to assemble round the Roman military station. Hence it is that many of our chief cities and towns occupy the sites of such fortified posts, or are in the immediate vicinity of them. Thus it is probable that Norwich originated in the decay of Venta-icenorom, as Salisbury arose out of Sorbiodunum, or Old Sarum. An old distich commemorates the former event.

"Castor was a city, when Norwich was none;
And Norwich was built with Castor stone."

"I have nowhere met with the name of Norwich," says Camden, "before the Danish invasion. So far from its being founded by Cæsar or Guiteline the Briton, as is pretended by those who embrace every story without weighing it." On the origin of the name, multifarious opinions have been formed; leaving the wild conjecture of Polydore Virgil, who thought he plainly discovered Norvicus in the word Ordo-vices, the name of a British tribe who inhabited the opposite part of the island, which opinion was afterwards adopted by Dr. Caius; there can be no room for doubt that this place received its appellation from the Saxons; the word Northwic, in their language, signifying a northern station, castle, or town. And on the Saxon coins of various reigns, the word occurs in their exergue, with the mint-master's name. Blomefield, in his History of Norwich, has enumerated several of these. Thus it appears from the most authentic documents, that Norwich was a place of note previous to the Danish dynasty.

On the dereliction of Britain by the Romans, the Saxons sent their own troops to this part of the coast, under a pretence of assisting the Britons against their northern enemies. But quickly changing the character of auxiliaries into that of invaders, they began to erect fortresses to defend the possessions they had seized, and enable them to execute their

plan of finally occupying the whole island. At this period the castle of Norwich, or the fortification on the Wensum, was probably constructed. The elevated spot on which this castle stands,—a promontory at the north-western extremity of a ridge of land which extends from the site of the ancient Caistor to the Wensum, and commands a prospect over a large space of country,—pointed it out as an eligible place to fix an advanced post. The East Anglian monarchy was probably established between the years 530 and 540, and the castle erected about the same period. In the year 642 it is said to have been a fortified royal seat of Anna, the seventh king of the East Anglian line. During the numerous incursions of the Danes it was frequently possessed by them and by the Saxons alternately. Its situation rendered it an object of importance to the former, and it appears to have been occupied by Ingwar, a Danish chief, in the year 870, when king Edmund was assailed in his palace at Hoxne, and killed by his enemies. The Danes took possession of the country, wintered at Thetford, and usurped the monarchy of East Anglia. The reign of Alfred was distinguished by his repeated and decisive victories over those northern marauders; and one grand object of that monarch's care was to fortify the principal parts of his kingdom against hostile attacks; castles and cities which had been destroyed or dilapidated, he rebuilt, and constructed several new and substantial fortifications, which enabled him to make such military dispositions as the impetuous invaders were never able effectually to counteract. At that time finding the walls or ramparts of Norwich castle incompetent for repelling the mode of attack adopted by the Danes, he caused others to be erected with the most durable materials, whereby he greatly improved its fortifications. That it was a military station of note, and a royal castle, in his time, is evident from the coin struck here about the year 872. In the reign of Etheldred, the castle is described to have been utterly destroyed by the army under Sweyne, king of Denmark, in the year 1004. This monarch was afterwards defeated by the Saxon earl Ulfkettle, and obliged to fly to Denmark. In 1010 the Danes again returned, and settled at Norwich, which they fortified. The castle appears to have been rebuilt by Canute, on his accession to the throne of England, about the year 1018, at which time its custody was entrusted to Turkil. The government was afterwards bestowed on Harold, who, succeeding to the English throne, conferred this castle on a Saxon thane, named Leofric. Soon after the Norman conquest, king William appointed Ralph de Waler to the earldom of Norfolk, and gave him this castle for his residence. That nobleman joined in rebellion with Waltheof, the powerful earl of Northumberland, but, having been defeated, he retreated to his castle of Norwich, which being invested by the royal army, he withdrew to Normandy, leaving to his countess the charge and defence of the fortress. The garrison, chiefly consisting of Armorican Britons, made an obstinate resistance, not yielding to the besiegers till compelled by the imperious necessity of famine; and then it obtained an honourable capitulation. The earldom and castle, thus confiscated, were conferred, A.D. 1077, on Roger Bigod, another of his Norman followers. After he was possessed of this important fortress, being in the interest of Robert Curthose, duke of Normandy, he retained it against William Rufus. Peace being signed between the two royal brothers, earl Bigod was guaranteed, by a prior stipulation, in his landed possessions, and the government of the castle. In the reign of Stephen it was seized by the crown, but again conferred upon the family of Bigod. In the reign of Henry II. it is stated by some writers, that Roger Bigod,

who then possessed this fortress, rebuilt, or materially altered, the castle, and that the present keep-tower is part of the work then erected. The same authors observe, that the castle was now rendered impregnable, but this is evidently a mis-statement, for in the reign of king John, Hugh Bigod was expelled, and William Marshall, earl of Pembroke, with John Fitzherbert, associated in the shrievalty of Norfolk and Suffolk, and were appointed, by patent, constables of the castles of Norwich and Orford. Of these fortresses, Hugh de Burgh, afterwards earl of Kent, was made governor. In the year 1240, the custody was committed to Hamon Passelow, to hold during the king's pleasure. In the reign of Henry III., Lewis of France sent troops into England, to assist the barons, when Norwich castle was besieged, and forced to capitulate. Thomas de Brotherton, second son of Edward I., obtained the honor and custody of it from the Bigods. In the time of Edward II. the honor consisted of one hundred and twenty knights' fees; which were equal to eighty-five thousand acres of land. The power of the earls appears soon after this to have been abridged, for the sheriff of the county was authorized by the king to use the castle for a prison, to keep persons charged with crimes in safe custody, till the itinerant justices should hold their courts of oyer and terminer. This authority of the sheriffs was repeatedly resisted by the earls, which occasioned an act to be passed in the fourteenth year of Edward III., empowering the former to have the privilege of the same gaols and prisons as they formerly used.

Of the Architecture, ancient and present State of the Castle.—Some antiquaries contend that the chief part of the present fabric was constructed by king Canute; and Mr. Wilkin, in the "Archæologia," remarks, that "although the building is of Danish workmanship, it is, notwithstanding, in the taste of architecture practised by the Saxons, long before England became subject to the Danes; and is the best exterior of this kind of architecture extant." Blomefield conceives that the present structure was erected by Roger Bigod, in the time of William Rufus, and that it occupies the site of a brick building, which was raised by Canute. He also thinks it was considerably repaired and beautified by Thomas de Brotherton, in the time of Edward II. Gurdon, in his Essay towards a History, &c. of this Castle, contends for its Danish origin, and says that Canute's arms were "lions passant guardant;" and that the impost stones of the great portal, in the eastern front, have two lions carved on them in basso-relievo. From the same circumstance, Camden ascribes the building to Bigod. Mr. King, while he contends for the architecture being Saxon, supposes the keep-tower to have been built in the time of Canute. "As to the keep, or master tower," he observes, "the only considerable part now standing, the style of its architecture is, in many respects, so different from that of the towers erected in the reigns of William Rufus, and Henry I. and II., and the ornaments are so different from those which were in use in the reign of Edward II., when pointed arches had been long introduced, and were esteemed the most elegant of any, that I cannot but think the building of much greater antiquity (*i. e.* than the time of Bigod and Brotherton), and completely Saxon, though it is possible the staircase might be repaired, or even rebuilt, by Thomas de Brotherton, whose arms are to be seen on part of the wall. In short, as to the main body of the building, I take it to be the very tower which was erected about the time of king Canute, who, though himself a Dane, yet undoubtedly made use of many Saxon architects, as the greater part of his subjects were Saxon. And I am the more induced to form this con-

clusion, because I can find no authentic account whatever of the destruction of the castle built in Canute's time, either by war or by accident, or of its being taken down, in order to erect the present structure, as is supposed by some."

The promontory on which the keep is built, appears to be a natural elevation, excepting some little addition which may have been made by art, by throwing out the earth from the inner foss; for it is observable that the ground from the castle a mile southward, is nearly on a level with the upper ballium, although it declines to the west, and is rapidly declivous towards the river on the east. The area of the ancient castle, including its outer works, contained about twenty-three acres, the whole of which was surrounded by a wall. This space comprehended three *ballia*, each defended by a lofty vallum and deep foss. The principal entrance was by *Bar*, now Bere-street, through Golden-lane, by the Barbican gate, which was flanked by two towers, and connected with the external vallum by a wall. On the eastern side, towards the river, was a postern, which led to a circular advanced redoubt, where the river forms a double or horse-shoe bend. On the inside verge of the outer vallum was a strong wall, the space included between which and the middle foss constituted the first ballium. The second ballium comprised the space between the middle and inner foss, and was defended by a similar wall. The upper ballium, as it was termed, because its altitude far exceeded the other two, circumscribed the citadel. The walls, according to Grose, "were commonly flanked with towers, and had a parapet embattled, crenellated, or garreted; for the mounting of it there were flights of steps at convenient distances, and the parapet often had the merlons pierced with long chinks, ending in round holes, called *œilets*."

The walls of the city, built in the year 1294, were thus formed; but it does not follow that those of the castle, erected at a more remote period, were so constructed. They have long been down, the outer and inner valla levelled, and the fossa filled up for building, and other purposes. Near the south-west angle of the inner ballium is the square keep-tower, the antiquity and architecture of which have afforded a very fertile theme for disputation. "Its extent from east to west, including a small tower, through which was the principal entrance, is 110 feet 3 inches; and from north to south, 92 feet 10 inches; and the height to the top of the merlons of the battlements, 69 feet 6 inches. The height of the basement story is about 24 feet, the outside of which is faced with rough flint, and has no external ornament, except two arches on the west side." From the basement story upwards, the whole building consists of three stories, each strengthened by small projecting buttresses, between which the walls are ornamented with semicircular arches, resting upon small three-quarter columns. The backs of some of these arcades are decorated with a kind of reticulated work, formed by the stones being laid diagonally, so that the joints resemble the meshes of a net. To give it a greater richness of effect, each stone had two deeply-chafed lines, crossing each other parallel with the joints, so as to exhibit a mosaic appearance. On the east side of the keep is a projecting tower, of a richer kind of architecture, called Bigod's tower; and as it is evidently of the Norman style, it was probably an addition to the original building, made by Roger Bigod, in the time of William Rufus. The interior of the keep is an unroofed area, but was formerly divided by floors, covered in at top, and separated into several spacious apartments. The basement floor appears to have been vaulted over with stone, some vestiges of which are still to be traced. It is conjectured, that the well was situated nearly

nearly in the middle of the keep. Within this fortress there was formerly a royal chapel, exempt from all episcopal jurisdiction.

The castle precinct contains six acres, one rood, and thirteen perches, and the summit of the hill is in circumference 360 yards: the whole of the latter is inclosed with iron palisades and gates. Under an act of parliament, passed in 1806, the castle and its limits are vested in the justices of the peace for the county, in trust; by which they are empowered to build, repair, or alter any part belonging to it, as they may think proper.

Civil History of the Town and City, its Progress, Charters, Liberties, Wards, Parishes, political History, Population, &c.—The town of Norwich probably soon succeeded the building and establishment of the castle, and was originally occupied by the Romanized Britons from Venta Icenorum, and the Saxons, who came first to assist, and afterwards to subdue them. During the Danish incursions, it is said to have been burnt by Sweyne, who sailed with his fleet up the Wensum. According to some writers, it was chiefly occupied, at this time, by merchants and fishermen: but if so, considerable alterations must have taken place in the course and extent of the river; for it must appear strange that such persons would form a settlement at a place between 30 and 40 miles from the sea. It is evident, that very material alterations have been effected in the tide rivers on the English coast, since the Romans left the country; and these changes have occasioned much embarrassment to topographers, and produced apparent contradictions in their writings. If the town was rebuilt by Canute the younger, in the year 1018, it must have had a rapid increase; for in the time of the Confessor, it appears to have had 25 churches, and 1320 burgesses. At this time, the property, exclusive of the Newburgh, was divided amongst four proprietors. Of the part in which dwelt 1238 burgesses, the king and the earl of Norfolk had *jac* and *soc*; 50 were amenable to the court of Stigand; and of 32, Harold had the *soc*, *jac*, and patronage. Hence, at that period, the town appears to have exceeded, in the number of burgesses, either Lincoln, Ipswich, Cambridge, or Canterbury. It was then deemed a hundred of itself, containing 833 acres of land and meadow, having also a sheep-walk within its jurisdiction; so that it must have extended nearly a mile beyond the limits marked out by the present foundations of its walls. During the peaceable reign of Edward, and that of his successor Harold, it continued rapidly to increase both in wealth and population; but in the year 1075, by the siege it endured in the rebellion of Ralph de Waher, it suffered prodigiously, and experienced a serious decrease. Many of the citizens, who had espoused the earl's cause, fled; others were banished by the king's general, Waleram, as aiders and abettors; and some were forced to quit the place from circumstantial necessity, it having been partially burnt during the siege, by which they were deprived of the means of residence. Between the years 1083 and 1086, in which the general survey of the whole kingdom, contained in Domesday-book, was made, it appears that numerous houses were vacant, though the number of churches had increased; there being, by the first part of the survey, 25, and, by the second part, 54.

The number of burgesses, at this time, began again to increase, and the houses amounted to 738; which, allowing six persons for each house, makes the number of inhabitants at that time 4428. Though Norwich then contained this comparatively small population, yet it was in size second only to York, excluding the metropolis, as appears by the following estimate of the most considerable places in the kingdom. York contained 1118 families, Norwich 738,

Ipswich 538, Exeter 315, Canterbury 262, Hertford 146, Warwick 113, Southampton 84, Bath 64, and Northampton 60. Enjoying an interval of domestic peace, in the reign of William Rufus, and the bishop's fee being removed here from Thetford, a considerable addition was made to its population, by the vast influx of Jews, who about that time came over from Normandy. They had first been allowed to settle in England by the Conqueror, as chapmen for the confiscated goods of his subjects; and, encouraged by his son and successor, their numbers were greatly increased. In the reign of Henry I., the government of the city was separated from the castle jurisdiction; and in the following reign of Stephen, Baker, in his Chronicle, says, "the king gave licence to the city of Norwich to have coroners and bailiffs; before which time they had only a serjeant for the king, to keep courts." This was considered as the dawn of the corporation; and in the time of Richard I., A.D. 1193, the inhabitants of Norwich were recognised under the title of citizens. In consequence of a representation how much the place had suffered, in the rebellion of the barons against king John, and at other times, the citizens obtained leave to surround the city with a wall, and to erect gates and bulwarks for its defence. These were begun in the year 1297, and finished 1320; but they were not completely fitted up and fortified till the reign of Edward III., A.D. 1342. At that time, Richard Spynk, a wealthy citizen, erected additional walls, and towers, with portcullises to the gates, and furnished the garrison with various military engines, ammunition, &c.

The year 1336 will ever be memorable to the inhabitants of Norwich, for the influx of a numerous body of ingenious Flemings, and the introduction of the worsted manufactures, which are still denominated Norwich-stuffs. This city has suffered greatly, at various times, by the plague, and scarcity; and few places have sustained greater losses from accidental fires. These are attributable, not only to the quantities of timber used in building, but to the imprudent practice of covering the houses with straw, a custom not yet entirely disused. Two desolating fires, which happened at the close of Henry VIIIth's reign, induced the corporation to issue an order, that no new erected buildings in the city should be covered with thatch. The prosperity of the place, which had begun to decline, was revived in 1566, by the settling here of three hundred and thirty Dutch and Walloons, who had fled from the Netherlands during the violent persecution under the duke of Alva. In 1571 the number had increased to 3925, and by the invention of bombazines, and other articles in the weaving manufacture, they contributed much to the general population of the place. In 1574, when a rumour was spread of invasion, by means of the Invincible Armada, Norwich, towards the general defence, exhibited on its muster-roll 2120 able men; 400 of whom were armed. In 1578 queen Elizabeth made a progress through the county, and took up her abode for several days in this city, where she was entertained with great hospitality and loyalty. In the time of Charles I. the city declared for the parliament, and during that rebellion it was possessed by their forces, till Cromwell was declared protector of the realm. In the year 1663 the charter was renewed by Charles II.; it was resumed by James II., or at least the privileges suspended, and restored to its full extent again in 1688. By virtue of this, the government is vested in a mayor, recorder, steward, two sheriffs, twenty-four aldermen, of whom the mayor is one, and sixty common councilmen; a town-clerk, chamberlain, sword-bearer, and other officers. In the third year of queen Mary's reign, A.D. 1556, the extent of ground, called "the city and county of

Norwich," was ascertained and confirmed, by which it appears to be fourteen miles in circumference, comprehending nearly 6630 acres. The measurement from the Guildhall, in the market place, to Mile-cross, on the north, is one mile and six furlongs; to Thorpe, east, one mile and four furlongs; to Harford bridges, south, two miles and two furlongs; to Earham Bounds, west, two miles and four furlongs.

Norwich was early represented in parliament; it received the first summons in the twenty-fifth year of Edward I. to send members to the national council; but it is unknown who were returned on that occasion; the list of parliamentary burgesses commencing the following year. In 1403, the fourth year of Henry IV., the king's writ summoned *four* citizens to be returned to parliament for this city: but so far was amplitude of representation then from being considered an extent of patronage, that the city employed John de Alford to obtain the king's licence to send *two only*, as before; whose services were remunerated by the payment of three pounds. The king evidently meant to confer additional honour upon the citizens by this extraordinary privilege; but burgesses in parliament at that period were allowed wages for their attendance, and the citizens objected to this distinguished mark of royal favour, upon the ground of additional expence. The city at present sends two members, who are chosen by the freeholders, and by certain other persons who are free of the city by inheritance, servitude, or purchase. The sheriffs for the time being are the returning officers. By a private statute, passed in the year 1738, "for the better regulating elections in the city of Norwich," it is enacted, "that the right of election is in the freeholders, and such freemen of the city only as are entered in the books, and do not receive alms or charity."

Till within a few years, the population of Norwich had been increasing. From the year 1693, in which the first accurate enumeration was taken, to 1752, the number of inhabitants had increased 7288, which is rather more than 123½ annually. From the year 1752 to 1786, the increase was 3882, or rather above 121 for each year.

Manufactures, &c.—No place in the kingdom, Manchester excepted, has made a more distinguished figure in the weaving trade than the city of Norwich. At what era of our history the art of manufacturing cloth from wool was first practised in this island, is not recorded. Like many other necessary and useful arts, its origin is wrapped in the oblivion of distant ages, and from that circumstance, it is highly probable, this was amongst the most early discoveries. Anterior to the time of William the Conqueror, woollens of various qualities and texture composed the principal manufactures; but soon after that period a sort of cloth work was introduced, which, though not a new discovery, had not been previously practised in England. This was a totally different production from what had usually been denominated cloth; the preparation being by a combing instead of a carding process. By the former the wool is drawn out to a very long, in the latter to a short staple; that is, the fibres of the fleece are extended the whole length in the one instance, and broken and intermixed in the other. The art of combing wool is attributed, as a discovery, to Blasius, a bishop of the eastern church, in the fourth century, who is still venerated by the woolcombers as the patron saint of their trade. Respecting the time it was first exercised in this county, different opinions have been entertained. Owing to an inundation in Flanders, numbers of the inhabitants of that province came over to this country in the time of Henry I. Some of them settled in Pembrokeshire, and Blomesfield supposes, that others fixed their abode, first at Worstead, and after-

wards at Norwich: and from their setting up the making the articles manufactured from jersey, or combed wool, at the former place, such have ever since been denominated worsted stuffs. In the reign of Edward II., a patent was granted to John Pocock, investing him with the exclusive privilege of measuring every piece of worsted stuff made in the city of Norwich, or county of Norfolk. But this having been found to operate as a restraint on the trade, the letters were soon afterwards recalled. What tended to increase, and raise to an enviable height, this species of manufacture, was the number of Flemish artisans who came over in the year 1336. Their arrival was occasioned by the great intercourse at that time kept up between this country and the Netherlands, the English king having married Philippa, daughter of William, earl of Hainault. The discovery of fullers'-earth, about this period, a substance so useful in the trade, and with which England abounds, contributed greatly to further their exertions in the weaving craft. Various staples were appointed for the sale of wool, and its exportation was prohibited under heavy penalties. On this occasion, the city of Norwich was fixed for the staple of the counties of Norfolk and Suffolk. In the time of Richard II., and succeeding reigns, various statutes were enacted for the encouragement and regulation of the trade, by further prohibitions against sending unmanufactured wool out of the kingdom, and for the measuring the manufactured articles, as well as for the sale of cloth. In the twenty-third year of Henry VI., an act passed, ordering four wardens to be chosen for the city of Norwich, and four others for the county of Norfolk, "to do right, and make due search of worsteds in Norwich and Norfolk, and which shall set down orders for the *true making thereof*." It having been discovered in the following reign, "that divers persons in Norwich and Norfolk make *untrue* wares, by which means they lose their ancient estimation beyond sea, &c." The number of wardens was increased. From this act it seems, the trade had arrived at such a degree of excellence, as to rival other nations in the foreign market; and English goods probably then obtained an extensive sale in those very countries whence the art had first been imported. In the time of Henry VIII., according to Blomesfield, the sale of stuffs made in the city of Norwich only, amounted to the annual sum of 200,000*l.*, exclusive of stockings, which was computed at 60,000*l.* more. Not only did the trade thus flourish at Norwich and Worstead, but it had now spread over the country; for, by an act passed in the fourteenth year of this reign, it appears "that the making of worsteds, saies, and flammings, which had greatly increased in the city of Norwich, and county of Norfolk, was now practised more busily and diligently than in times past at Yarmouth and Lynn." The wardens of these towns, therefore, were put under the controul of the jurisdiction of Norwich. During the reigns of Edward VI. and queen Mary, new articles of manufacture continued to be introduced, and new regulations passed for the making of russels, satins, satins-reverses, and Naples-sutlans, as had been done before for the making of hats, dornicks, and coverlets; and the manufacturers of such new articles were formed into a corporation, endowed with exclusive privileges. Subsequent to this the trade fell into decay, and a new era of its revival commenced. By the advice of the duke of Norfolk, queen Elizabeth was induced to offer an asylum in her dominions to the inhabitants of the Low Countries, who had fled from the persecution of the duke of Alva. These people brought with them their arts and industry; they were allowed to settle in Norfolk, and each master to bring with him ten servants at the duke's charge. They rapidly increased, and the county was essentially

tially benefitted by their skill and exertions. New fabrications were introduced by the intermixture of silk, mohair, and wool; and several new articles were manufactured, as various in their qualities as their names; such as bayes, sayes, arras, and mochades. In 1575, the Dutch elders presented in court a specimen of a novel work, called bombazines, for the manufacturing of which elegant stuff this city has ever since been famed. In the reign of George I., an act was passed to compel the makers of any kind of stuff to become freemen of Norwich, as the manufacturers of ruffs and fustians had formerly been. The preamble states, that it was made to furnish the city with a proper supply of able magistrates; but the policy of the measure lay deeper than the statement. In the twenty-fifth year of George II., a statute was enacted to open the port of Great Yarmouth, for the importation of wool and woollen yarn; a circumstance which proved highly beneficial to the general trade of this city and county. From a statement furnished by a master manufacturer in the year 1724, it appears that 120,000 persons were then employed in the woollen, worsted, and silk manufactures. Not that the whole of these persons resided in the city, but they were employed in some branch of the trade, and their labours were conducive to the productions of Norwich.

The staple articles of this manufacture, at present, are bombazines, worsted damasks, flowered satins, and fine camblets; for the latter, the East India Company have given annually large orders, which has afforded some relief during the torpor of the trade to Italy and Spain. To these articles has been recently added the manufacturing of cottons, shawls, and other fancy goods, adapted both for furniture and drefs, which for elegance, at present, surpass any thing of the kind made in England. The making of cotton thread-lace has also been introduced; and the trade in linen, called Suffolk hempen, is in a flourishing state. The staple manufacture of Norwich furnishes about fifty distinct occupations, reckoning from the shearer who procures the fleece, to the mariner, who ships the bale goods; and when trade is very brisk it employs one hundred thousand persons. The Lincolnshire and Leicestershire wools are chiefly used, while those of Norfolk are mostly sent for the use of the Yorkshire clothiers. "The earnings of the manufacturers are various. Dyers and hot-pressers earn about 15s. a week, combers about 12s., some of the best weavers from 14s. to a guinea; weavers in general, on an average not more than 6s., but then many women can earn as much, and children, by spinning, pipe-filling, and tyre-drawing, earn from 9d. to 2s. 6d. per week."

Of the Churches, religious Houses, and other ecclesiastical Subjects of the City.—At an early period Norwich was distinguished for its numerous monastic structures. Herbert de Losinga established the see at Norwich in the year 1094, and laid the foundation stone of the cathedral in the year 1096. It has been said, that "the first building was chiefly composed of wood;" but this is not very probable, as there can be no doubt that parts of it still remain. How much was completed by Herbert is not clearly defined; though it is stated, that the choir, with its aisles, also the transept and tower, were erected by him. To this Eborard, his successor in the see, added the nave, with its two aisles, extending from the antichoir, or rood-loft, to the west end.

Thus it stood, though not fitted up till 1171, when it was damaged by fire. John of Oxford, the fourth bishop, repaired this injury, supplied the church with proper vestments, and decorated it with ornaments, about the year 1197. Walter de Suffield, the tenth bishop, made another addition, by erecting the Virgin chapel at the east end,

which has since been demolished. In the year 1272, the cathedral was again injured by fire, but was repaired A.D. 1278. Soon after the tower, or the steeple, appearing to have been materially injured by the fire, it was taken down, and another erected at the sole expence of bishop Ralph de Walpole. The old chapter-house was built by the same bounteous prelate, who also erected that part of the cloister, which extends from the entrance of the chapter-house to the grand door-way into the church. Three more arches, on the same side, were executed by the clerk of the works, Richard de Uppehall. The remaining five arches, and the south side of the cloister to the arch, where the espousals was carved, were erected by bishop Salmon, with the assistance of the monks; who, on this occasion, suppressed the office of pittance, and expended on the work the pittances of the convent. The north side, towards the church, was built by Henry de Well, who gave 210 marks himself, and obtained several donations to carry on the work. He was also allowed a portion of the pittance money. The west side, from the carving of the espousals, the highly ornamented entrance towards the refectory, the lavatories, and the door-way into the pilgrims' hall, were built by Jeffery Simonds, the then rector of St. Mary-in-the-Marsh. The part extending from the pilgrims' hall door-way, to the entrance into the church inclusive, was the work of bishop Wakeryng, who erected the new chapter-house, which was afterwards destroyed in the civil wars. In the year 1430, in the one hundred and thirty-third year from its commencement, this spacious, elegant, and justly celebrated cloister was finished, in the presidency of bishop Alnwick, by whose executors the west end of the cathedral was rebuilt. In 1361, a hurricane blew down the upper part of the steeple, and at that time the present spire was built.

Plan, Dimensions, Divisions, Architecture, &c. of the Cathedral.—The architecture of this noble pile of building is chiefly of that style called Norman, wherein the semicircular arch, and large short column, are the leading features. These are considerably varied in size, mouldings, and ornaments, in different parts of the structure. The plan displays a nave, with side aisles, a transept, a choir, with semicircular east end, and an aisle surrounding it. Attached to, but projecting from this aisle, near the east end, is a small chapel dedicated to Jesus, and on the opposite side, at the south-east angle of the church, is another, called St. Luke's chapel. West of this is a square building, projecting from the aisle, now used as the consistory court. Between this and the transept is Heydon's chapel, and the old chapter-house. Abutting to the south transept, are the precincts gaol or dungeon, and St. Edmund's, or the priors' chapel. West of these, and attaching to the south side of the nave, are the cloisters. Such are the component parts of the cathedral, which joins to the bishop's palace on the north side, and to the deanery, &c. on the south. The following are given as the measurements: extreme length of the church, from east to west, 411 feet, and of the nave, from western door to transept, 140 feet. The extreme width of the latter is 191 feet, of nave, with aisles, 72 feet. The cloisters form a square of 174 feet within the walls. They branch off from the southern transept, and inclose a square court or area: eleven windows, or arched openings, are on the western side, twelve on the opposite side, eleven to the north, and the same number on the southern side. All these windows are divided into three lights, by two columns, and all are decorated with tracery; the latter presents much variety and dissimilarity. At the south-west angle is a large lavatory. The roof is supported by groins, springing from clustered columns, and ornamented with very bold bosses at their points

points of interfection. The door-way leading from the eastern aisle of the cloisters to the nave is very curious. It is in the pointed arch style, with four columns on each side, having corresponding archivolt mouldings, in front of which are seven canopied niches, with richly sculptured crockets, and each including a statue.

The west front of the cathedral displays a large central compartment, fronting and corresponding with the width and height of the nave; also two lateral divisions corresponding with the side aisles. The elevation of the former shews a large central window, divided into three leading compartments in height, and the same number in width. These are again subdivided by small mullions, and the whole produces a highly ornamented effect. Beneath it is the grand entrance door-way, formed by a bold pointed arch, having its spandrils and side fascia much enriched with mouldings, niches, pedestals, statues, and other sculptured decorations. The nave and aisle on the south side present five tiers or stories of windows and arcades, though part of the lowermost is obscured by one side of the cloisters. Above this is a series of blank arches, or arcades, of the semicircular style, divided into fourteen compartments, by a flat buttress between each, and every division consists of six arches. In the next tier upwards, each compartment shews three semicircular arches, the central of which is opened and glazed, whilst the other two are blank. Over this is a flatly pointed arch window, with two mullions in each division. This constitutes the elevation of the aisle, which is unusually lofty and narrow. Above this is a series of arches to the upper part of the nave, displaying in each compartment a pointed arched window in the middle, with a semicircular moulding over it, and two lateral blank arches. The sides and front of the transept nearly correspond, in the number and style of arches, with the division just described. At the interfection of this transept, with the nave and choir, rises a lofty tower, surmounted by a spire, the whole height of which is 315 feet. The former exhibits four stories, besides that of the battlements; and each is covered with arcades, columns, and tracery mouldings, of very varied and curious workmanship. It is an interesting specimen of the Norman style of architecture, exemplifying it at that period, when the semicircular and intersecting arches with tall light columns were prevalent, and just before the pointed arch was generally adopted. The battlements and pinnacles at the angles are of a later style, as is the octangular spire, which has bold crockets attached to, and running up, the ribs at each angle. In the interior of the choir and its aisles a very dissimilar style of architecture is exhibited; for the former has large lofty windows, with pointed arches, ornamented with mullions and tracery, whilst the latter displays several windows with square heads, divided by three mullions and tracery. These windows are curious and rare examples of form. Bold buttresses project from the upper part of the choir, across and over the aisle. Of the interior it must suffice to remark, that it is grand and solemn in the general effect; that the piers, columns, arches, and mouldings, are in a bold and substantial style. It is much to be regretted by every architect, antiquary, and man of taste, that the modern fittings up of the choir, pewing in the aisle, encumbered state of the transepts, &c. tend to disfigure the building, and destroy all harmony, propriety, character, and beauty. The present choir, or part appropriated for cathedral service, is made to extend from the semicircular east end across the transept, and to the third column in the nave. This space is nearly enclosed with boarded and painted partitions, filling up the arches, and shutting out the sight from all general and comprehensive views of the building.

Tombs, &c.—The cathedral contains various sepulchral memorials. The tomb of bishop Herbert, the founder, was destroyed in the time of the civil war; and a new altar monument was erected to his memory by the dean and chapter in the year 1682. It stands in the central part of the choir, inclosed with an iron palisade. This part of the church contains also the graves of most of the prelates who have filled the see; but few interesting monuments now remain. There are mural stones to the memory of bishops Scambler and Overall. Between the ninth and tenth pillars, reckoning from the west, was a chapel, now thrown open, where is an altar-tomb, deprived of its brasses, under which was interred sir James Hobart, who was attorney-general to king Henry VII. Till the reformation this chapel was the chantry, belonging to the Hobart family. In Jesus chapel stands a tomb, removed from the chapel of the Virgin Mary, erected to the memory of sir Thomas Wyndham, who was knighted by sir Edward Howard, in the fourth year of king Henry VIII.; he died at his seat at Felbrigge, October 22, 1521. Among other celebrated persons, whose place of sepulture is in this church, may be noticed John Heydon, esq. a great favourite of Edward IV.; sir Henry Heydon, knight, who built at his own expence Salhouse church; sir William Boleyn, great grandfather to queen Elizabeth; sir Roger Bigod, knight, sewer to king Henry I.; sir Walter de Berney, Calthorp, Bosvill, Baconthorpe, &c. In the chapel called our Lady the Lefs, is an arched mural monument to sir William Beauchamp, the founder, who lived in the reigns of Edward I. and Edward II.

The bishops palace, on the north side of the collegiate precinct, is not the one built by the founder of the cathedral, though it stands upon the same site. The original building was pulled down, and a larger structure erected by bishop Salmon, in the year 1318; in the rebellion it partook of the general injuries which were committed on ecclesiastical buildings by the fanatic spirit of the times. The greater part was let out in tenements, and the grand hall converted into a meeting-house. Jesus chapel, in the cathedral, was originally appropriated to the use of the prelate; but being found inconvenient, bishop Salmon erected another near the palace. In this, which was one hundred and thirty feet long by thirty broad, were buried the founder, and several other prelates. In 1619, it was licensed for the Walloon congregation. During the rebellion it was greatly injured, and its fine painted windows mutilated.

A List of the Bishops of Norwich.—1. Herbert Lofinga, having removed the see from Thetford, held it till his death, in 1119.

2. Eborard, or Everard, after a vacancy of nearly three years, was advanced to the prelacy in 1121. He retired in 1146, and was succeeded by

3. William Turbus, on whose death, in 1175,

4. John of Oxford, dean of Salisbury, was elected. He died in 1200, when

5. John de Grey was promoted to the see. He died at Poitou in 1214. The bishopric was then vacant above seven years, and was conferred, in 1222, on

6. Pandulphus, the pope's legate. On his death,

7. Thomas de Blandeville was consecrated in 1226; dying in 1236.

8. Ralph was elected in his stead; and died the following year.

9. William de Raleigh, after a contest of three years, obtained the see in 1240. On his translation to Winchester, in 1244,

10. Walter de Suffield, or Suthfield, was elected: he died in 1257, and was succeeded by

11. Simon de Waltone, who died in 1265; when,
12. Roger de Skerwing was consecrated; he held the see thirteen years: on his death
13. William Middleton, archdeacon of Canterbury, succeeded in 1278. He died in 1288, when
14. Ralph de Walpole, archdeacon of Ely, was elected. Being translated to the see of Ely in 1299, his place was supplied by
15. John Salomon, or Salmon, who enjoyed the bishopric twenty-six years, and died in 1325.
16. Robert de Baldok was elected to succeed him, but out of submission he resigned in the same year.
17. William de Ayrmynne was consecrated in 1325, and died in 1336.
18. Thomas Hemenhall was elected in 1337, but being in the same year removed to the see of Worcester,
19. Anthony de Beck was appointed bishop by the pope's mandate: he died in 1343, and was succeeded by
20. William Bateman, dean of Lincoln, who founded Trinity-hall, Cambridge, for the express purpose of supplying his diocese with a succession of qualified pastors. He died at Avignon in 1354.
21. Thomas Percy, brother to the earl of Northumberland, succeeded by papal authority, though but twenty-two years of age. On his death, which took place in 1369,
22. Henry Spencer was consecrated by the pope in person. This prelate was the first who quartered the episcopal arms with his own. He died in 1406.
23. Alexander de Tottington, prior of Norwich, was promoted to the see on the death of Spencer, and held it till 1413; when, on his death,
24. Richard de Courteney, chancellor of Oxford, was elected; but died within two years.
25. John Wakeryng, archdeacon of Canterbury, was elected in 1416; and died in 1425.
26. William Alnwick, archdeacon of Salisbury, succeeded, by papal mandate, in 1426. He was translated to Lincoln in 1436, when
27. Thomas Brown, or Breus, bishop of Rochester, was translated to Norwich by a bull of pope Eugenius IV. He died in 1445, when John Stanberry, a Carmelite friar, was elected but never consecrated, through the interference of the pope.
28. Walter Hart, or Lyhart, master of Oriel college, Oxford, was then appointed by papal mandate. He held the see twenty-seven years, and died in 1472.
29. James Goldwell, the pope's prothonotary, was consecrated at Rome by pope Sixtus IV. in 1472. On his death, in 1498, Christopher Urfwyke was elected, but on his refusal of the honour,
30. Thomas Jane, archdeacon of Essex, was consecrated in 1499, but died the next year.
31. Richard Nykke, archdeacon of Exeter, succeeded, and having filled the episcopal chair thirty-five years, died in 1535.
32. William Rugg, or Reppes, abbot of St. Bennet's in Holme, was advanced to the bishopric by Henry VIII. for his assistance in forwarding the king's divorce. He died in 1550, when
33. Thomas Thirlby, the first and last bishop of Westminster, was promoted to the see of Norwich, whence he was translated to that of Ely, in 1554.
34. John Hopton, prior of the Dominican monastery, succeeded; and died in 1559, when
35. Richard Coxe, who in the following year was translated to Ely by queen Elizabeth, who nominated in his stead
36. John Parkhurst, who was consecrated Sept. 1, 1560, and died Feb. 2, 1574.
37. Edmund Freke, bishop of Rochester, was translated to Norwich, July 13, 1575, and hence to Worcester, December 1584, when
38. Edward Scambler, bishop of Peterborough, succeeded. He died May 7, 1594.
39. William Redman, archdeacon of Canterbury, was elected December 1594, and died September 25, 1602.
40. John Jeggon, dean of Norwich, was advanced to the bishopric February 20, 1603, and died March 13, 1617.
41. John Overall, bishop of Lichfield and Coventry, was translated to the see of Norwich, May 21, 1618, but held it only one year. On his death
42. Samuel Harsnett, bishop of Chichester, was translated to this see; whence he was preferred to the archbishopric of York, November 6, 1627, and was succeeded here by
43. Francis White, bishop of Carlisle, who was translated hence to the see of Ely, December 8, 1631, when
44. Richard Corbett, bishop of Oxford, was promoted to Norwich, where he died July 28, 1635.
45. Matthew Wren, bishop of Hereford, and father of that eminent architect sir Christopher Wren, was translated to this see November 16, 1635, and was removed to that of Ely, April 1638.
46. Richard Montague, bishop of Chichester, was translated to Norwich, May 4, 1638, and died April 1641.
47. Joseph Hall, bishop of Exeter, was translated to this see November 1641; but was deprived of his rights by the usurped authority of the house of commons.
48. Edward Reynolds was consecrated January 6, 1660, and died July 28, 1676.
49. Anthony Sparrow, bishop of Exeter, was translated hither August 28, 1676. He died May 19, 1685.
50. William Lloyd, bishop of Peterborough, was promoted to Norwich June 11, 1685; but, on the accession of king William, refusing to take the oath of abjuration, he was deprived of his bishopric. In his stead
51. John Moore was elected May 21, 1691, and having held the see sixteen years, was translated to that of Ely. He was the most celebrated collector of scarce and valuable books in England. On his decease, George I. purchased his immense library, and presented it to the university of Cambridge.
52. Charles Trimmel, archdeacon of Norwich, was consecrated bishop February 8, 1707, and was translated to Winchester in 1721; on which
53. Thomas Green, archdeacon of Canterbury, was advanced to this see; whence he was removed to that of Ely, September 4, 1723.
54. John Long, chaplain to George I., was promoted to this bishopric October 2, 1723, and died October 26, 1727.
55. William Baker was translated from the see of Bangor to Norwich, in 1727. He died December 4, 1732. He was succeeded by
56. Robert Butts, dean of Norwich, who was consecrated bishop January 25, 1733, and was translated to Ely in 1738, when
57. Thomas Gooch, bishop of Bristol, was removed hither. In 1748 he also was translated to the see of Ely, and was succeeded here by
58. Samuel Lisle, bishop of St. Asaph, who held this see only one year.
59. Thomas

the duke for the city workhouse; but since the poor-house in St. Andrew's parish was enlarged, the whole scite has been sold, and built on by different proprietors. Fuller says this palace was the largest he had ever seen out of London. Among its various accommodations for amusement, were a theatre, tennis-court, and bowling-alley. The latter was the first of the kind in England, and when Thomas, duke of Norfolk, was accused of aspiring to the throne of Scotland, by his intended marriage with Mary, queen of Scots, he protested to Elizabeth, that when in his bowling-alley at Norwich, he considered himself equal to a king of Scotland. On the north side of Newgate stands Surry house, a curious specimen of domestic architecture; in the windows of which were emblazoned, on glass, many armorial bearings.

Among the more eminent natives of this city, are William Bateman, better known in records by the name of William de Norwico, from the place of his birth. He was son of William Bateman, who served the office of bailiff, and in 1326 represented the city in parliament. Mathew Parker a pious and learned divine, and archbishop of Canterbury in the time of queen Elizabeth, was born in the parish of St. Saviour, in this city, August 6, 1504. John Kaye, better known by his latinized name of Caius, an eminent physician in the reigns of queens Mary and Elizabeth, was born at Norwich in the year 1510. Edward Browne, a distinguished physician in the reign of Charles II., the eminent son of an eminent father, sir Edward Browne, was born in this city about the year 1642. Dr. Samuel Clarke, a learned and polemical divine, who was distinguished in the latter part of the seventeenth, and beginning of the eighteenth century, was the son of Edward Clarke, esq. who was alderman of Norwich, and for several years one of its representatives in parliament. He was born October 11, 1675. William Cuninghame, a physician of Norwich, was born in the year 1531. Thomas Legge, antiquary, born in 1535. John Cofin, bishop of Durham, the eldest son of Giles Cofin, a citizen of Norwich, was born November 30, 1594. Edward King, F.R.S. and F.S.A. descended from a Norfolk family of high respectability, was born at Norwich 1734. He died in London April 16, 1807. Annals of Norwich, in Watson's Anglia Sacra, a complete history of the famous city of Norwich, 8vo. 1728. A history of this city forms two volumes of Blomefield's collection, for the county of Norfolk. Beauties of England, vol. xi. 1809, by J. Britton, F.S.A.

NORWICH, a considerable township in Windfor county, Vermont, on the W. side of Connecticut river, opposite to Dartmouth college; containing 1486 inhabitants.—Also, a township in Hampshire county, Massachusetts, 14 miles S.W. of Northampton; incorporated in 1773, and containing 959 inhabitants.—Also, a city and post-town of Connecticut, and of the second rank in New London county, situated at the head of Navigation or Thames river, 14 miles N. of New London. This is a convenient city, and has an extensive and rich back country; and being situated on a navigable river, has convenient seats for mills and water machines of all kinds. The inhabitants manufacture paper of many kinds, stockings, clocks and watches, chaifes, buttons, stone and earthen ware, oil, chocolate, wire, bells, anchors, and all sorts of forge-work. It contains about 500 dwelling-houses, a court-house, two churches for Congregationalists, and one for Episcopalians, and 3476 inhabitants. The town consists of three divisions, viz. Chelsea at the landing, the Town, and Bean hill, in which latter division is an academy, and in the town is an endowed school. The courts of law are held alternately at New London and Norwich. This town

was settled in 1660, by 35 persons, principally from Saybrook; 251 miles N.E. of Philadelphia. N. lat. 41° 34'. W. long. 72° 29'.—Also, a township in Chenango county, New York, incorporated in 1793, settled principally by people from Connecticut, bounded southerly by Oxford, lying 55 miles W. of Cherry valley, and containing 2219 inhabitants.—Also, a place now called "Whitby," in Upper Canada, on the N. shore of lake Ontario.—Also, a township in Norfolk county, Upper Canada, E. of and adjoining Dereham.

NOSAG, a town of Bengal; 20 miles S.S.E. of Palamow.

NOSAPOUR, a town of Hindoostan, in the circar of Hindia; 10 miles N.E. of Hurdah.

NOSCHALSKOI, a town of Russia, in the province of Usting; 68 miles S.E. of Lalk.

NOSE, in *Anatomy* and *Physiology*, the organ of the sense of smelling.

The nose consists of two large cavities, called nostrils (nares), a right and left, formed by the bones of the face, extending from before backwards, placed between the two orbits above, and immediately over the palate below, and separated from each other by a perpendicular flat partition, called the septum narium.

The nostrils, of which the right and left are perfectly alike, are surmounted in front by a pyramidal organ, composed of cartilage, and called in common language the nose. At the basis of this are two openings, leading into the nostrils. These cavities terminate behind, by two much larger apertures, in the upper and front part of the pharynx.

The bones composing the nose are described individually in the article CRANIUM, which contains also a general account of the cavities resulting from their union. The bony hollows are lined by a vascular membrane, called the pituitary or Schneiderian, on which are distributed the olfactory nerves, the immediate seat of the sense.

As the nostrils are open in front to the external air, and behind to the pharynx, on the surface of which the entrance of the air into the trachea (rima glottidis) is found, they serve, as well as the mouth, for the passage of the atmosphere in respiration to and from the lungs. Odours disseminated in the air are thus brought in contact with the pituitary membrane, and impress the olfactory nerves in that membrane.

In the detailed description of the apparatus of the sense of smelling, we shall notice, 1, the external organ; 2, the general position, figure, and dimensions of the nostrils or internal cavities; 3, the communications of the latter with the pharynx; 4, the membrane lining them and its nerves; 5, the development of the nose; 6, the physiology of smelling.

I. The nose, which covers and completes the organ of smelling towards the front, occupies the middle and upper part of the face, bounded above by the forehead, below by the upper lip, and on the sides by the orbits and cheeks. The size and form are subject to numerous varieties; but the latter is most commonly that of a triangular pyramid, with its basis downwards, its apex upwards; a posterior surface confounded with the nostrils, and two lateral ones. Each of the latter is separated from the cheek behind by a semi-circular groove, which then advances a short way upon the lateral surface. The two lateral planes meet together in front in a ridge of various breadth, directed obliquely from above forwards and downwards, and called in Latin dorsum nasi (dos du nez). This ridge ends below in a prominence constituting the tip of the nose (le lobe).

The basis of the nose presents two oval openings, separated

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rated by a partition continuous with that which divides the nostrils. Their outer sides are moveable, and are called the *alæ nasi*. The openings are always patulous, and thus afford a constant passage to the air in respiration; the cartilaginous nature of their sides provides for this circumstance.

The top of the nose is continuous with the forehead and eyebrows; behind, it is joined in the middle by the septum of the nostrils, and it is continued on the sides with the cheeks.

The nose is covered in front by a double layer of muscle and skin, and lined internally by a mucous membrane. But the essential part of the organ is a bony arch above, formed by the two *ossa nasi*, and, below this, membranous fibro-cartilages. Hence it is solid and capable of great resistance at the upper part, so as to protect the corresponding portion of the nostrils, the immediate seat of smelling made up of the thin brittle plates of the ethmoid, from external injury; comparatively weak, and susceptible of motion below, so that the openings may be expanded, contracted, or even entirely closed. The middle, although composed of cartilage, does not move; the dimensions of the openings are altered by movements of the sides or *alæ nasi*.

Cartilages of the Nose.—The most considerable of these is a piece which forms the sides of the anterior opening, and is called by Bichat fibro-cartilage des ouvertures nasales. Its figure is curved, as it consists of two portions or branches united in front at an obtuse angle at the tip of the nose. The external branch corresponds to the *alæ nasi*, and extends upwards and backwards to terminate in a point; it is covered by the compressor muscle, and by the skin on one side; by the mucous membrane on the other. The inner branch lies along the side and front edge of the septum, and contributes greatly, with the corresponding one of the opposite side, to the thickness of this part of the nose. It is broad in front, and terminates in a point behind. One surface of it is contiguous to the septum; the other is covered by the skin, and the commencement of the mucous membrane. The union of these two branches forms a prominence at the point of the nose, of which the convexity is very variable. There is generally a slight groove, which is sometimes hardly apparent, separating this from the corresponding part of the opposite side.

Another small piece is placed at the lower and back part of the *alæ nasi*, where it is continuous with the cheek; it is merely a flat portion of irregular figure, surrounded on every side by a kind of fibrous membrane, which unites it to the outer branch of the former, to the cartilage of the septum, and to the nasal process of the superior maxillary bone. This is placed between the skin and the mucous membrane.

The parts just described are of the fibro-cartilaginous texture; they retain their form, when no force is applied to them; so as to leave the nostrils free for the purpose of respiration; but they yield easily to the muscles connected with them.

The middle of the nose is formed by a piece of true cartilage, possessing greater firmness than the parts just described. It is called the cartilage of the septum, and by Bichat cartilage nasal. It is made up of three portions; two exterior and anterior, forming the sides of the upper part of the nose, and one posterior and middle completing the septum *narium*. These three portions are united in front, at the dorsum of the nose, at an acute angle. They are described distinctly by most authors, under the names of cartilage of the septum, and lateral cartilages.

The middle and posterior is the most considerable portion, and belongs to the internal cavities, as well as to the external organ. It is a broad flat piece situated on the middle line

of the nose, and has a triangular figure. Its direction is sometimes perpendicular; sometimes it deviates towards one side or the other; in the former case, its lateral surfaces are plane, in the latter convex and concave. These have several inequalities and pores, to which the membrane of the nose adheres very closely. The upper edge has an oblique direction, backwards and downwards; it is irregular, and either enclosed between two plates of the perpendicular lamina of the ethmoid, or, if that be single, simply continuous with it. The inferior margin is received behind between two plates of the lower, and is here rather oblique in the direction forwards and downwards; in front it is rounded, not adherent to any part, but placed between the internal branches of the right and left fibro-cartilages of the openings of the nose, and concurring with them to form the partition between those openings. The anterior edge forms the middle of the back of the nose; it is thick above, where it is subcutaneous and prominent, thin below, where it is entirely concealed by the internal branches of the fibro-cartilages of the nasal openings, between which it ends in an obtuse angle, formed by its union with the inferior margin, and corresponding to the tip of the nose.

This portion of the cartilage is porous and unequal on the surface; less flexible than the pieces described previously, and breaking much more readily when bent. Its structure, in short, is more perfectly cartilaginous, and gives it solidity corresponding to its functions, in which there is no motion.

The upper half of the anterior edge of the part just described gives origin to the lateral portion on each side. This is continuous with the middle piece at this part, but separated from it below by a cellular interval. Its form is triangular, and size variable; and it is directed obliquely along the side of the nose. Above, it is connected to the *os nasi* and superior maxillary bone by short ligamentous fibres; below, by a loose ligamentous tissue, to the external branch of the fibro-cartilage of the nasal opening. The external surface is convex, and covered by the compressor and skin; the internal is concave, and lined by the pituitary membrane. It is thin, and therefore has some flexibility, but its motions are always inconsiderable. When the openings of the nose are dilated, the *alæ* is the part that moves chiefly.

The cartilages just described are connected to each other, and to the edges of the bony opening by a thin, but tolerably firm fibrous membrane; to the inside of which the pituitary adheres very closely. They vary very much in size and figure, and hence arise numerous differences in the outward appearance of the organ in different individuals. These variations are of no importance anatomically speaking. The bony part of the nose is constituted by the *ossa nasi* and the nasal processes of the superior maxillary bones. These are united above to the frontal bone, and form a strong arch, by which the interior of the organ is protected.

The nasal fibro-cartilages give insertion to various muscles, which form a stratum covering them under the skin. These are the *EPICRANIUS*, *COMPRESSOR narium*, *DEPRESSOR alæ nasi*, *NASALIS labii superioris* (see those words), and the *levator labii superioris* and *alæ nasi*, (see *DEGLUTITION*.) The motions of the cartilages have reference to two effects, *viz.* the dilatation and contraction of the openings. In the former the *alæ* are drawn upwards and outwards, so as to enlarge the aperture laterally; we observe this motion in a person breathing very laboriously, and in some passions of the mind. The *alæ* is drawn downwards, and applied against the septum, when the opening is closed; this is a motion not very frequently performed.

The skin of the nose is loosely connected to the subjacent parts above, and more firmly below. It is remarkable in

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the latter situation for possessing a considerable number of sebaceous glands, the ducts of which appear on the surface, when the cuticle has been removed, in the form of numerous pores. Their contents may be squeezed out after death in slender white threads.

The organ is covered internally by a mucous lining, which forms the transition from the common integuments to the pituitary membrane. It is soft and vascular, has a very distinct cuticle, and numerous strong hairs, which are sometimes long enough to project at the opening.

II. *Cavities of the Nostrils.*—For their general figure, the bones composing them, &c. see CRANIUM.

The nostrils are separated from the cranium by the cribriform plate of the ethmoid; the palatine portions of the superior maxillary and palate bones form the inferior boundary, by which they are parted from the mouth. The orbital surface of the ethmoid and the os unguis close them towards the orbit; and they extend laterally to the projection of the cheek, under the eyes, if we include the maxillary sinuses.

Their direction is nearly horizontal, from the openings by which they commence in the face, to their termination in the pharynx: at the back part, however, they slope a little downwards, principally on account of the inclined surface of the body of the sphenoid. The inferior boundary, composed of the bony palate, is straight and horizontal. The superior is curved from before backwards, and composed in front of the ossa nasi, in the middle, of the cribriform plate of the ethmoid, and behind, of the body of the sphenoid. The ossa nasi slant downwards and forwards from the front of the ethmoid, and the sphenoid downwards and backwards from the back of the same bone. Hence the perpendicular measurement of the nostril is greatest in the middle, from the ethmoid to the superior maxillary bone, and it gradually decreases from this point towards the front and back openings. The antero-posterior diameter is the most considerable; the longest measure of this is in the middle; it diminishes upwards on account of the curved figure of the roof of the nose, and it also diminishes downwards, but not so much.

The transverse measurement is greatest below, and becomes smaller as we ascend: the superior concha is very nearly in contact with the septum. Indeed, that the transverse diameter of the nose is on the whole inconsiderable, must be apparent from the fact, that the swelling of the membrane in cold very often entirely obstructs the passage of air through it.

III. The opening of the nostrils behind into the pharynx is placed immediately under the basis cranii, and over the velum palati. There are two nearly oval apertures, about an inch in length, by half an inch wide, separated by the posterior edge of the vomer. The body of the sphenoid above, its internal pterygoid plates at the sides, and the back edge of the ossa palati below, form these openings, which must be insusceptible of change in their dimensions, as all these parts are fixed. The velum palati may be drawn up, so as to close these apertures, and prevent the air from passing through the nose in breathing, or to prevent the food in deglutition, or the contents of the stomach in vomiting, from being admitted into the nostrils. See DEGLUTITION.

IV. The cavities of the nose are lined throughout by a mucous membrane, which constitutes the essential organ of smelling. It is extended over all the eminences of the nostrils, and enters all the cavities. In front it is continuous with the skin, and behind with the mucous surface of the pharynx.

If we begin to trace it from the floor of the nose, we see it ascending along the septum to the roof of the cavity, forming no fold in its course, and easily detached from the bone and cartilage that compose the septum. It is continued on the under surface of the cribriform plate, of which it closes the foramina: in front it passes to the back of the ossa nasi, and behind to the under surface of the sphenoid, entering and lining the cells of that bone, sometimes contracting their orifice, sometimes leaving it as wide as in the skeleton.

The pituitary membrane is then continued over the external surface of the nostril, first covering the flat plate of the ethmoid and the superior concha, and then reflected at the convex edge of the latter, to enter the superior meatus. The fold is loose, and descends rather lower than the edge of the concha, so as to contract the entrance of the meatus: behind it is continued towards the pharynx, beyond the posterior end of the concha. Here it closes the sphenopalatine foramen, through which the pituitary receives vessels and nerves. The membrane lines the posterior ethmoid cells, then covers the middle concha, is reflected at its inferior edge, and thus enters the middle meatus, which it lines. It is prolonged through an opening, generally very narrow, into the maxillary sinus, which it lines. The entry to the sinus is near the front of the meatus; and the aperture leads into the upper and anterior part of the cavity. After removing the middle concha, a bony plate is exposed, covered by the pituitary membrane, and terminating above by an unattached edge: this plate conceals the narrow entrance of the sinus. The large opening of this cavity in the separate maxillary bone is diminished by the apposition of the surrounding bones; but it is still farther contracted by the membrane, of which there are two layers at this part; one belonging to the nose, the other to the sinus. Above the entrance of the maxillary sinus there is an aperture, by which the membrane passes into the anterior ethmoidal cells and the frontal sinus, without forming any fold.

From the middle meatus the membrane is continued over the inferior concha, forming a very thick and large fold at its margin, by which the apparent depth of the concha is much increased. At the edge of the inferior concha the membrane passes into the inferior meatus, lines it, is continued with the mucous lining of the ductus nasalis, and then passes to the floor of the nose, from which part we first traced it.

In front the pituitary membrane lines the cartilages of the nose: behind it goes out at the posterior nasal apertures to join the membrane of the pharynx, passing above under the body of the sphenoid, below over the velum palati. At the back edge of the septum, the membranes of the two nostrils are continuous with each other. Towards the outside of the opening it forms a more or less distinct perpendicular fold; behind which, just where the nose and pharynx join, it covers the cartilage of the Eustachian tube, forming above it a deep cul de sac.

The pituitary or Schneiderian is analogous to other mucous membranes in the fluid, which it produces, but differs from them in its thickness, which is much more considerable. Its colour is generally very red; but this differs in different parts and subjects. A fibrous layer, which is only the periosteum or perichondrium of the nasal cavities, is joined to a mucous stratum, in order to form the pituitary membrane, which must consequently be classed among the fibro-mucous organs. This structure may be very easily shewn by breaking the septum, and removing the fragments; the fibrous portion is not injured, because it adheres less firmly to

to the bone than to the mucous surface, while the perioſteum in other ſituations is much more cloſely attached to the bone than to the ſurrounding parts. When the pituitary is thus ſeparated, it forms a very thick membrane, whitish, denſe, and ſtrong on the ſurface next to the bone; ſpongy, ſoft, and red towards the noſe. Yet, though the external appearance and nature of the two laminæ are ſo different, they are inſeparably connected together. The mucous layer is compoſed of a well defined corion, to which its thickneſs is owing. Its ſpongy texture is obſervable, particularly about the conchæ, and more eſpecially at their edge. Many anatomists have ſuppoſed that mucous glands exiſt in this membrane; but we cannot demonſtrate them. However, numerous ſmall pores and cavities are obſervable on many parts of its ſurface, which may be conſidered as mucous lacunæ. There are no papillæ on it. The capillaries are very numerous and ſuperficial, and often bleed from very ſlight accidents: fine injections penetrate through the membrane in every direction, and give a general deep red colour.

In the proper cavity of the noſtril, the pituitary membrane has throughout nearly an uniform ſtructure; but its appearance is very different in the ſinufes. It is thin, not ſpongy, but ſmooth on the ſurface, eaſily detached from the bone, and poſſeſſing a much ſmaller ſhare of capillaries, except when it is inflamed.

The ſoft ſurface of the pituitary membrane is every where covered by a mucous fluid, either ſecreted by glands, if ſuch exiſt, or furniſhed by the exhalant arteries of the part. This fluid is thick, tenacious, and whitish, and more abundant in the cavities of the noſtrils than in the ſinufes. The paſſage of the air dries it, and converts it into a hard cruſt of different appearances. In that affection of the noſe, which conſtitutes a cold, this mucous fluid is poured out in increaſed quantity, firſt transparent and thin, afterwards thick, tenacious, and white, or yellow. The naſal mucus, under ordinary circumſtances, is probably, in part, evaporated by the conſtant current of air in breathing to and from the lungs: it is partly expelled by the ſtrong current of air directed through the noſtrils in the act of blowing the noſe, and probably flows through the back openings into the pharynx. The latter is the courſe which it takes in the act of hawking: by drawing the air into the lungs entirely by the noſtrils, the mucus is forced from thoſe cavities into the pharynx, and expelled from it again by the mouth.

The openings of the frontal and ethmoid ſinufes are ſo diſpoſed, that the mucus poured out in them will by its gravity paſs into the noſe: but this is not the caſe with the ſphenoid or ſuperior maxillary cavities. The mucus may run out of the latter, when the head lies on its ſide, but we do not ſee how it can be evacuated in the erect poſition.

It is, perhaps, hardly neceſſary to notice here the erroneous notion, which for ſo long a time prevailed univerſally in phyſiology and pathology, and which is generally entertained to this day by thoſe who are ignorant of anatomy, that the naſal mucus comes from the head, that it is a kind of excrement of the brain diſtilling through the foramina of the ethmoid. When we ſee an opinion, which an eaſy anatomical labour would have deſtroyed, univerſally maintained for centuries, we may conclude with certainty that the opportunities of reſearch were extremely limited, and that the anatomical works of the ancients muſt be completely deſtitute of information for us. Even Veſalius adopted the general error, which was not clearly refuted until after the middle of the 17th century, when C. V. Schneider publiſhed his work *De Catarrhis*, and ſhewed that there is no connection between the brain and noſe, that the dura mater covers the cribriform plate above, and a pecu-

liar membrane below, and that the latter, extended over the whole naſal cavity, is the ſource of the fluid generated in catarrh.

In conſidering the action of the air on the pituitary membrane and its ſecretions, we muſt bear in mind that that portion which is ſent from the lungs is moiſt air; that it is loaded with the watery vapour formed in the proceſs of reſpiration.

The nerves of the pituitary membrane are derived from different ſources. The origin of the olfactory, and its courſe to the ſuperior ſurface of the cribriform plate, are deſcribed in the article *NERVOUS System*. From the ſoft ganglion which it forms in the cranium numerous branches ariſe, and paſs through the holes of the cribriform plate. They acquire a firm covering in this paſſage, ſo that they are as hard on the outſide of the cranium as any other nerves. They paſs through the bony canals of different lengths, which are continued from the foramina juſt mentioned. The filaments, which penetrate the internal ſeries of holes, are expanded on the anterior and middle portion of the ſeptum narium: they divide into branches, which again ramify, and are ſometimes united by communications: they are ſo involved in the texture of the membrane, that they can hardly be traced below its middle. The outer ſeries of twigs is expanded in a ſimilar way on the ſuperior and middle turbinated bones, but cannot be traced beyond the convex edge of the latter. They are ſpent on that ſurface of theſe bones, which forms a part of the cavity of the noſtril, and not on that which is concerned in forming the ethmoid cells.

The lower and poſterior part of the ſeptum, and the inferior concha, receive branches from the ſuperior maxillary nerve. The naſal branch of the ophthalmic nerve is loſt upon the front of the ſeptum, and the tip of the noſe. See the deſcription of the ramifications of the nerves. For excellent deſcriptions and representations of the naſal nerves, ſee J. Hunter on the Animal Economy, and Scarpa Annot. Academ. lib. ii., particularly the latter. The pituitary membrane poſſeſſes two kinds of ſenſibility, correſponding to the two kinds of nerves diſtributed on it. The firſt is that peculiar ſpecies, by which it is enabled to perceive odours: it reſides in the olfactory nerves. The ſecond is common ſenſation, or the power of receiving thoſe general impreſſions which affect all organs poſſeſſing ſenſibility, and which, in this caſe, is exerciſed by the branches of the nerves of the fifth pair. That theſe properties are in ſome degree independent, is rendered obvious by the phenomena of diſeaſe. A tumour preſſing on the olfactory nerve, or any local diſeaſe affecting the ſame nerve, deſtroys the ſenſe of ſmelling; which ceaſes alſo in the inflammation accompanying a common cold: yet in both theſe inſtances, the common ſenſation of the part continues; and a foreign body, introduced into the cavity, will produce the ſame inſupportable tickling as in a perfectly healthy ſubject.

The pituitary membrane has very cloſe ſympathetic connections with other parts. Irritation of it by ſtimulating powders, acrid fumes, even by its own ſecretion in increaſed quantity, &c. will cauſe a flow of tears, and excite that convulſive action of the reſpiratory muſcles, called ſneezing. (See LUNGS.) Certain odours excite nauſea, and even ſickneſs; and ſome cauſe fainting. It has been aſſerted, that the impuſe on the retina, when a perſon comes ſuddenly from a dark place into a bright light, will cauſe ſneezing. The brain is moſt readily excited in ſyncope, by applications to the noſe. This is a fact univerſally known, ſo that burnt feathers, ammoniacal ſubſtances, &c. are immediately applied to the noſe of a perſon diſpoſed to faint. It will be

observed, that in almost all these cases, an irritation of the pituitary membrane affects other parts; and that the pituitary is affected sympathetically, only in the instance of sneezing, or exposure to a strong light, even if that be admitted.

V. *Progressive Development of the Nose.*—The eye, at the time of birth, is as large and as perfect in its structure as it will be at any subsequent period of life; and most parts of the internal ear are equally complete in their formation, at the same time. But the case is very different with the nose, of which the formation, at the time of birth, is very incomplete.

Instead of the diversities which are observed in the noses of adults, that of the fœtus and the child has almost invariably the same form, character, and size. It is flattened, and extends more laterally. The uniformity of its figure coincides with the general uniformity of the face at this age; and its difference from the shape of the adult nose corresponds with the general difference of character in the countenance of the child and grown person. The back openings are very short from above downwards, and very oblique: the latter circumstance arises from the inclination of the pterygoid processes forwards.

The cavities of the nostrils are remarkable for their smallness: the perpendicular diameter is very inconsiderable, the antero-posterior is longer, and the transverse does not differ so much from that of the adult as the others.

In the septum, the lamina of the ethmoid is cartilaginous, and forms a single layer with that of the proper cartilage of the septum: the vomer is already ossified. The conchæ are long, but very narrow. The ethmoid cells do not yet exist, this part of the bone being almost entirely cartilaginous; but slight traces and rudiments of them may be discerned. The frontal, sphenoidal, and maxillary sinuses are not yet formed. The pituitary membrane is less dense, and its capillaries are very abundant. The roof of the cavity, formed by the cribriform plate, and its floor, are considerably advanced in their formation. The olfactory nerve is remarkably large, so as to present a striking contrast to the size of the organ: it is proportionably larger than the optic. The nerves of the body in general do not correspond in size with the development of the organs, as the arteries do.

It seems probable that the power of smelling is very imperfect in the infant: odours appear to affect them very little. Blumenbach notices a relation between this state of the sense and the condition of the individual, at the age we are now considering. "*Cuivis attendenti quoque patet, nullo quam hoc sensu infantes tenellos facilius carere: nec hebetiorem diutius perferre posse alium, quam ipsum odoratum. Partem enim nimis adhuc imbeciles sunt, ut sibi ipsi alimenta quærere nequeant, nec ad distinctionem eorum acri odoratu indigent, verum pro respectu vario longe diutius, quam quodvis aliud animal, aliena cura egent. Partem quoque debiliorem odoratu ipsis consultum videtur, cum ex ipsa eorum imbecillitate nonnulla in ipsos incommoda redundant, quorum injucunditate, delicatiore naso magis afficerentur.*" De Sinib. Frontal. p. 7.

The sinuses do not begin to be developed till some time after birth: the maxillary does not appear before the teeth, and its development coincides with that of those organs, but is not so rapid. The frontal and sphenoidal do not begin to appear until after the maxillary. All of them are formed very slowly, and they are by no means of their full size, when the growth of the body in general has ceased. The change of the voice at puberty, and after castration, is independent of any peculiar development of the sinuses.

The general cavity of the nose has reached its full size in

adult age, but the sinuses still increase. This growth is not, however, indefinite, although we cannot assign the precise period when it stops. In the old subject, the pituitary membrane loses its redness, and becomes more dense. The power of smelling, as well as that of tasting, is less frequently lost in old age than that of seeing and hearing: the former, Bichat observes, are more closely connected with the organic life, of which the functions go on in old age, after those of the animal life have partly ceased.

VI. In the last division we have anticipated many remarks, that might be arranged under the head of the physiology of smelling.

The nature of odours is very little understood, and has been the subject of few, if any, experimental investigations. The remark of Haller is still applicable to it: "*Nescio quomodo factum sit, ut in salium figuras, lucis radios, aeris tremores, subtilissimis experimentis sit inquisitum, ad corpuscula vero, quæ odorem excitant, cognoscenda, adeo exigua hominum fuerit curiositas,*" &c. (Elem. Physiol. t. v. p. 154.) The notion generally entertained is, that most, or perhaps all, bodies constantly give off a something, called odorous particles or effluvia, which is expanded in the surrounding air. We know only that the presence of odorous bodies is perceived by us through the medium of the atmosphere; and that the element, whatever it be, which affects us, is of almost infinite divisibility. A small particle of musk will scent a room for many days, and affect numerous succeeding atmospheres; yet there is no perceptible loss of substance in the musk. Two grains of camphor dissolved, filled a room with its peculiar smell; whence it was found by calculation, that a particle not heavier than $\frac{1}{2263384000}$ of a grain, must have been perceived by the nose. Haller mentions that a large quantity of papers were scented by a single grain of ambergris, and that the odour was retained at the end of 40 years; therefore, at the lowest calculation, a square inch of paper received its odour from $\frac{1}{2263384000}$ of a grain. We shall not be surprised, after considering such examples, which indeed are quite familiar, to read the accounts of travellers, who state that the spicy fragrance of Arabia, Sumatra, Ceylon, &c. is discovered by the nose at the distance of many miles (30 or 40, for example) from the shore. The power of tracing their prey by the scent, in animals, is another proof of the wonderful subtilty of the odoriferous particles; although we may be permitted to doubt some of the examples commonly referred to this head, as that of a dog following his master 100 leagues after some days, of the vultures being attracted from Asia by the effluvia of the bodies after the famous battle of Pharsalia, &c. &c.

Haller concludes that the odoriferous effluvia are more gross than light, heat, or magnetic and electric fluids; since they penetrate glass, which the former do not.

Although the odoriferous effluvia seem, from the preceding accounts, to be extremely subtle, they are capable of producing very considerable and well-marked effects on the human frame. Not to mention the well-known action of very unpleasant odours in exciting nausea, and even vomiting, Haller has collected many cases in which purging, convulsions, and even fainting, have been caused by smelling particular substances. Ambergris, musk, roses, &c. have had the latter effects. The idiosyncrasies, in consequence of which the smell of a cat, of cheese, &c. cannot be tolerated, are well known. Examples are not wanting of death produced by very offensive smells, particularly of the putrid kind; and it is related that very powerful aromatic scents have been equally fatal. The smell of saffron is said to be capable of producing sleep, even in the mules who carry it.

Haller

Haller has attempted to arrange odours into certain classes; but he seems to have arrived at no very striking results. The distinctions of them, according to their effect of exciting pleasure or aversion in us, are not quite constant. Although in general, as Haller observes, all mankind are pleased by the smell of the rose, the violet, and cinnamon, &c., and detest that of a putrifying body, of fæces, or of the polecat; yet peculiarities of constitution, habit, and association, have great effect in making us like or dislike particular smells. Haller says, that he could not bear the smell of cheese, of meat at all approaching to putrefaction, of garlic, or any strongly smelling substance. We soon approve of the smell of things which are serviceable in ministering to our wants. "Gratus hinc Grælandiæ incolis odor olei balænarum, et phocarum; quibus populis in ea ultimæ terræ habitabilis infecunditate, nihil præter pisces, natura reliquit prædidi. Eos ergo rancidissimos adipem eadem cum voluptate potant, cum qua Europæi calyces Falerni ficcant. Gratus odor Siamesibus ovorum incubatorum, qui ejusmodi ovis vescuntur: gratus casei odor iis, qui hoc cibi genus amant. Africani cadaveribus putridis elephatorum pascuntur. Romani fetidissimum garum, putridum nempe hepatum piscium liquamen, habebant in deliciis." *Elem. Physiol. tom. v. p. 170.*

The nose is the most common passage for the atmospheric air to and from the lungs in respiration: when the mouth is open, that also partly transmits the air, but if we continue to breathe long in this way, a disagreeable dryness of the tongue, &c. is produced. The odoriferous effluvia are carried into the nose by the air, brought into contact with the pituitary membrane, and thus impress the olfactory nerves, so as to cause perceptions of odours; hence we smell without any particular action or effort, in the ordinary process of breathing. When we wish to explore the odorous qualities of a body more accurately, we close the mouth, and draw in the air by repeated small inspirations, so as to bring several fresh portions into contact with the pituitary membrane: this is called sniffing.

It is only by the medium of the atmosphere that odours are conveyed into the nose; if the passage through these cavities be obstructed, as by elevating the velum palati, closing the front openings, by polypi, &c. the perception of odours ceases.

We do not conceive that the whole nose is equally the seat of this sense, which, on the contrary, appears confined to the upper region of the cavity, to the superior turbinated bones, and the upper part of the septum, on which the olfactory nerve is distributed. That the sinuses are not essential to smelling, must be concluded from the circumstance that children smell before these cavities are formed. No affection of the nose, no disease of its bones, which does not involve the parts just specified, injures the sense. The curiously convoluted structure of the superior conchæ, the artificial arrangement of the foramina and canals, both in these and in the septum, and the numerous nerves distributed here, all concur in making us fix on these parts as the organs of smelling. In the plain bony excavations forming the sinuses, in the thin membrane lining them, and provided with hardly any discernible nerves, we see no marks of a structure denoting an organ of sense. In birds and fishes there are parts analogous to the conchæ, with similar distribution of olfactory nerves; but no sinuses.

It is not, perhaps, so easy to determine the use of the sinuses. Some have conceived that they are connected with the power of speech or voice, and contribute to render it more sonorous. This notion has been well refuted by Blumenbach, with respect to the frontal sinuses; and his re-

marks are equally applicable to the others. "*Loquelæ enim, eximie hominis prærogativæ, hos inservire sinus, ex eo improbabile est, quod tot animalia infra recensenda similibus quidem sinibus, nullum vero, præter hominem, loquela instructum sit: quia et variis in morbis, de quibus postea sermo erit, sinus frontales absque loquelæ detrimento plane defecerint. Sed neque ad vocem, quæ humano generi cum reliquis animalibus, quæ per pulmones spirant, communis est, multum nobis conferre videntur. Infans enim, diu antequam ipse confici sunt sinus frontales, et antequam loqui didicit, voce acuta pollet: et multa animalia vocalia absque sinibus; et contra stupendis alia sinibus, attamen debili saltem voce prædita, videbimus. Denique per universam fere Europam innotuit exemplum Jo. Beckii, qui cum magna palati tam mollis quam ossei parte pleraque etiam nasi organa (viz. ossa nasi, septum cum vomeris maxima parte, spongiosa inferiora in totum, eorum autem quæ ad os cribrosum pertinent magnam partem) perdidit. Is spongiam obturatis sinibus et frontis et reliquorum calvariæ ossium, adeoque absque ullo narium sinuumque juvamine, imo absque molli uvula, (quam magis deglutitioni quam sermoni prodesse exinde concludere licet) distincte fatis loqui, et sonoras voces edere poterat: cum e contrario sublata spongia et apertis adeo ex larynge ad sinus calvariæ viis, plane non loqui et ægre vociferari potuerit.*" *Prolusio Anatom. de Sinibus Frontalibus; 1779.*

It seems most probable that the sinuses are connected with the business of smelling; for we can assign no other function to them, and they are largest in animals, which have this sense in the greatest perfection; we are at a loss, however, to shew how they contribute to this process. Some have conceived that the air, loaded with odoriferous effluvia, enters them and is retained, so as to make the odour more permanent. Blumenbach thinks that the frontal sinuses secrete a watery fluid, which is of use in moistening the pituitary membrane in the upper part of the nose, and rendering it more sensible.

The sense of smelling performs many important uses in animals; it enables them to trace their prey, and conducts them, at considerable distances, to objects that afford them subsistence. By pointing out the distinction of wholesome and noxious plants, it protects the health of the herbivorous tribes. It discloses to them the approach of their friends and enemies; and assists in the gratification of their appetites by guiding them, at the season of love, to those of their own species.

The advantages which the human species derives from this sense are not so obvious. In civilized society we make little or no use of it in selecting our food; indeed we consume very offensive things, as rotten cheese, stinking meat, &c. and it is not clear that the latter is less wholesome than what is fresh. Uncultivated people are not deterred by what we deem the most disgusting effluvia, of putrefying whales, seals, fish, and rancid oil, from employing these matters for food, and do not seem to be injured by their use. A man is not led to his mate by the scent, like a bull or a stallion. We derive, however, pleasure from the exercise of smelling, when it is employed on some kinds of odours; and this has been regarded as an object of the sense. "*Quod autem creator opt. max. humano naso tam insignibus sinibus, tamque mira et intricata fabrica studuerit, hoc vero tanto magis ejus bonitatem declarat, quanto certius homini nasus, non ut ceteris animantibus tantum necessitatis causa, ut victum nempe discernere possit, sed magnam partem ad voluptatem quoque et jucunditatem datus est. Quanquam enim impreffiones, odoratus ope in sensorium commune effectæ, tenues plerumque sint et transitorie; tamen ex omnibus quinque,*

quos vulgo numerant sensus externos, nullus alius tam celeres tam efficaces in toto encephali et nervorum systemate producit effectus, quam ipse, de quo agitur, odoratus. Ut enim momentaneas et mirandas vires fragrantium rerum in syncopatis, taceamus, certum est, omnium reliquorum sensuum effectus, quin omnino sanitatem hominum, jucundis aut foetidis odoribus mirum quantum vel augeri, vel hebescere, et persuasi fumus, nullus alias sensationes adeo delicatas esse, quam quæ per odoratum fiunt." Blumenbach de Sinib. Front. p. 15.

NOSE, *Fractures of*. See FRACTURE.

NOSE, *Hemorrhage from*. See EPISTAXIS.

NOSE, *Polypi of*. See POLYPUS.

NOSE-Band, in the *Mange*, called in French *muferelle*, is that part of the head-stall of a bridle that comes over a horse's nose.

NOSE-Bleed, in *Botany*. See ACHILLEA.

NOSE-Peak, in *Geography*, a mountain on the east coast of the island of Paraguay. N. lat. 8° 56'. E. long. 118° 25'.

NOSE-Point, a cape on the east coast of the island of Paraguay. N. lat. 8° 59'. E. long. 118° 42'.

NOSIMA, a small island of Japan, in the straits between Nippon and Xicoco.—Also, a town of Japan, in the island of Ximo; 20 miles N.N.W. of Taifero.

NOSOCOMIUM, νοσοκομειον, an hospital, or infirmary, for the reception of the diseased.

NOSOLOGY, from νοσος, *disease*, and λογος, *discourse*, signifies literally a treatise or doctrine of diseases; in which sense it might be considered as synonymous with *pathology*. The term *nosology*, however, has been appropriated exclusively to a methodical arrangement of diseases, after the manner of the classification adopted by natural historians, of which several ingenious systems were devised during the last century.

The advantages resulting from an arrangement of this kind, both to the learner and to the practitioner of medicine, have been long acknowledged by able and learned physicians. Baglivi, Sydenham, Boerhaave, Gaubius, and others, expressed their desire to see such a work accomplished, from a conviction, that, like the objects of natural history, diseases would be more easily and certainly discriminated, by being arranged under genera and species, with characteristic definitions. In truth, the analogy in the method of investigation, in both cases, is very close: for it consists in studying and comparing the *external characters*, and in separating those which are possessed in common with other genera, from those which peculiarly belong to any individual genus. Thus, in respect to diseases, as the condition and movements of the internal organs of the animal frame are not open to the immediate cognizance of our senses, we can only obtain information concerning them, by an investigation of the external signs or *symptoms*, which, as we are taught by experience, indicate certain internal operations. (See DISEASE.) Every intelligent and discriminating practitioner must, therefore, have formed a species of nosological system in his own mind; i. e. he must have ascertained the symptoms which are characteristic of the different forms of disease, and which distinguish each form from those others which resemble it. "Whoever denies this," as Dr. Cullen well observes, "may as well deny the existence of the medical art. For if physicians can actually discriminate between one disease and another, they certainly can point out the marks of such discrimination. Now these marks are, in fact, the very circumstances which enter into the nosological definition of the genera and species of disease, and which it is the object of a rightly constructed nosological system to

explain." (See his Synopf. Nosol. Method. Prolegom.) It can scarcely be doubted, then, that the study of nosology must contribute to improve the means of discrimination of the physician, and must facilitate the progress of the inexperienced in the acquisition of his art.

Another advantage, which has been alluded to by Dr. Cullen, will also accrue from it; it will conduce to render the views of the practitioner more clear and determinate, and to lead him to investigate and prescribe for the actual varieties of disease, rather than to content himself with learning their titles, and with considering that every essential information has been acquired, when the name of a disease has been made out; a habit into which those practitioners, whose education has been conducted without an attention to nosological accuracy, are too liable to fall.

Notwithstanding the obvious and acknowledged importance of a system of nosology, no actual attempt was made to accomplish such a work, before nearly the middle of the eighteenth century, when the able and learned Dr. F. Boissier de Sauvages, a professor at Montpellier, published the rudiments of his system in 1732. This work, however, contained but an imperfect outline of his final classification, which was not given to the world until it had been matured by extensive investigation, much reading, and assiduous application, for the space of thirty years. It was published in 1762, under the title of "Nosologia Methodica, sistens Morborum Classes, Genera, et Species, juxta Sydenhami mentem, et Botanicorum ordinem." As this elaborate and ingenious system has not only been generally referred to, but forms, in fact, the groundwork of all the systems of nosology that have subsequently appeared, we shall state the outlines of it with as much brevity as possible.

Sauvages arranged all the maladies and injuries to which the human frame is liable, under ten classes. The *first* class includes a number of superficial and local affections, which, however, have no very distinct affinity in other respects, and is entitled "*Vitia*." These vitia are subdivided into seven orders or groups, comprehending spots, efflorescences, inflammatory tumours, excrescences, encysted tumours, displacements (i. e. all the varieties of hernia, &c.), and plagæ (i. e. fractures, dislocations, ulcers, and wounds). His *second* class includes the three orders of *fevers*, continued, remittent, and intermittent, with their several species. The *third* class comprises the "*Phlegmasiæ*," or inflammatory fevers, of which he makes three orders, viz. the exanthematic, or eruptive fevers; the membranous inflammations, such as pleurisy, gastritis, enteritis, &c.; and the parenchymatous, or inflammations of the substance of the different organs, as of the lungs, liver, heart, kidneys, &c. The *fourth* class comprehends the "*Spasmi*," or convulsive diseases, which he subdivides into four orders; the first and second of which include the *tonic* or rigid spasms, partial and general (such as locked jaw, cramp, squinting, &c.); and the third and fourth, the *clonic* or convulsive spasms, partial and general (e. g. tremors, palpitation, yawning, epilepsy, hysteria, &c.). The *fifth* class consists of affections of the respiration, entitled "*Anhelationes*," and is subdivided into two orders, the spasmodic affections, sneezing, cough, hiccup, &c.; and the oppressive, as asthma, dyspnoea, snoring, hydrothorax, &c. The *sixth* class includes those maladies which are characterised by loss of power, either of the whole body, or in particular organs, and is entitled "*Debilitates*." Of this there are five orders; 1. "*Dysæsthesiæ*," lost or deficient sensations, such as blindness from cataract, amaurosis, deafness, loss of smell, taste, &c.; 2. "*Anæsthyia*," loss of appetites; 3. "*Dyscinæsiæ*," lost

lost or imperfect motions, including dumbness, loss of voice, stammering, and palsy; 4. "*Leipopsychia*," lost or impaired voluntary motion, as fainting, suspended animation, &c.; and 5. "*Comata*," soporose diseases, apoplexy, catalepsy, lethargy, &c. The seventh class, which comprises the painful maladies, "*Dolores*," is likewise subdivided into five orders, according to the parts of the body in which the pains are seated: 1. *Vagi*, or wandering pains, including gout, rheumatism, catarrh, itching, lassitude, &c.; 2. Pains of the head, hemicrania, tooth-ache, ear-ache, ophthalmia; 3. Of the breast, dysphagia, pyrosis, cardiognus; 4. Internal abdominal pains, heartburn, colic, pains of the liver, kidneys, &c.; and 5. Pains of the limbs. The eighth class comprehends the mental affections, "*Vesania*," and consists of four orders; 1. "*Hallucinationes*," such as giddiness, double vision, hypochondriasis, and somnambulism; 2. "*Morositates*," or erroneous appetites, such as pica, bulimia, polydipsia, satyriasis, nymphomania, nostalgia, hydrophobia; 3. "*Deliria*," as mania, melancholy, demonomania, &c.; and 5. Anomalous vesaniæ, as loss of memory. The ninth class includes discharges or fluxes, of which there are four orders: 1. "*Sanguifluxus*," or hæmorrhages, as hæmoptysis, hæmatemesis, bloody urine, uterine hæmorrhage; 2. Discharges from the bowels, "*Alvifluxus*," as vomiting, dysentery, cholera, diarrhœa, tenesmus, lentergy. &c.; 3. "*Serifluxus*," or watery discharges, morbid sweating, diabetes, enuresis, ptialism, coryza, leucorrhœa, gonorrhœa, dysuria, &c.; and 4. "*Aërifluxus*," flatulence, &c. The tenth and last class comprehends the various morbid appearances, which are considered as the result of a depraved habit of body, and are entitled "*Cachexia*." It includes seven orders, the first of which is characterised by emaciation, "*macies*," and comprises phthisis, tabes, and atrophy; 2. The opposite state of enlargement, "*Intumescencia*," such as emphysema, anasarca, obesity, pregnancy, &c.; 3. Partial dropsies, such as hydrocephalus, hydrorachitis, ascites, tympanites, &c.; 4. "*Tubera*," including rickets, scrofula, cancer, the yaws, &c.; 5. "*Impetigines*," as syphilis, scurvy, itch, scald head, lepra, and elephantiasis; 6. Morbid complexions, "*Ictericæ*," such as jaundice, chlorosis, petechial disease; and 7. Anomalous cachexies, as the lousy disease, trichoma, alopecia, gangrene, necrosis.

Such is the outline of the able and learned arrangement of diseases, which was accomplished by Sauvages. It displays an extensive knowledge of the physiology and pathology of the human body, derived both from much personal observation, and from an indefatigable perusal of the records of medicine; and, for practical purposes, it has not been equalled by those systems which have been subsequently erected upon it, as a basis, if we except perhaps that of Dr. Cullen. At the same time it must be obvious, even from a perusal of the preceding outline, that the classification is not free from several errors and imperfections. Some of these it possesses in common with all other attempts to arrange into classes the works of nature; for anomalies occur in diseases, as in the objects of natural history, which disturb the unity of artificial arrangements, uniting dissimilar genera, and rendering necessary the separation of others, which a general analogy would connect. Other imperfections, however, in the classification of Sauvages, appear to be the result of a want of accurate attention or discrimination. Several diseases, for instance, are found under more than one class, and bearing different generic appellations: thus the shingles, zoster, or zona, of the ancients, is described under the title of herpes zoster, and likewise under that of erysipelas zoster, probably from a doubt to which genus it bore the greater affinity. In like manner the petechial rash is included

under the genus Stomacace, in the order of hæmorrhages, and also under Phænigmus, in the order, Ictericæ, of the cachectic class. Again, Dr. Cullen has justly blamed Sauvages for introducing among the genera of disease a great number of mere symptoms, which are trifling in themselves, and seldom alone the objects of medical treatment; among these may be mentioned yawning, stretching of the limbs, lassitude, picking of the bed-clothes, nictitation of the eyelids, &c. He has also made genera of disease of other changes in the animal body, which cannot be considered as actual diseases; such as pregnancy, for instance, the efforts of parturition, the cicatrix left after wounds, the sensations produced by severe cold or great heat, (*algor*, and *ardor*,) and several other trivial and scarcely morbid occurrences. These observations are, besides, equally applicable to a great number of the species, or subdivisions of the genera, in his classification, which he has often multiplied unnecessarily, and even inserted repeatedly with different specific epithets. But although, in a philosophical point of view, as well as for the purpose of initiating the student into the various phenomena of diseases, this multiplication of genera and species must be deemed objectionable; yet the practitioner, in the progress of his professional researches, will be aided in the work of observation (a task of no small difficulty) by the hints which this subdivision of the phenomena of diseases will afford him. And this aid will be the more advantageous to those who unite the perusal of books with actual observation; inasmuch as the majority of the specific subdivisions of Sauvages, are, as it were, synonyms of the varieties of the generic maladies, which different local circumstances have occasioned, as detailed by the best practical writers, to whom he regularly and correctly refers.

Encouraged by the example, and above all aided by the previous original labours of Sauvages, several authors soon followed his steps in the contrivance of nosological arrangements. The celebrated naturalist, Linnæus, was one of the first to extend his singular skill in classification to the subject of diseases; and after having published the outlines of his scheme in a thesis, in 1759, he printed his system complete in 1763, with the title of "*Genera Morborum definita*." It consisted, however, rather of a modification of the system of Sauvages, with a change of names and titles, than of an original arrangement; and it wanted the support of the medical learning and experience, which were so conspicuous and valuable in the former.

In the year 1764, professor Vogel, of Gottingen, published his system of nosology, which was likewise a close approximation to that of Sauvages, but displayed a considerable share of personal observation of the phenomena of diseases; and twelve years afterwards, professor Sagar, of Vienna, followed a similar method, and published another modification of the system of Sauvages, under the title of "*Systema Morborum Symptomaticum*," Vienna, 1776. In the mean time, however, Dr. Cullen, the celebrated and able professor of medicine in the university of Edinburgh, had also published his own system of nosology in the year 1772; which, although leaning upon that of Sauvages as a basis, was much shortened and condensed, by a judicious exclusion of a number of trivial genera, and of many affections which are merely symptomatic, as well as by an union of several other genera, which were considered as only more or less prominent symptoms of the same essential malady, under one genus. This abbreviation of the system has certainly contributed to introduce a more simple and philosophical view of diseases, by merging under a smaller number of divisions all the varieties of human malady, and thus of course reducing the number of curative indications, and rendering

ing the principles of pathology and of therapeutics more clear and less complex. We shall, therefore, enter briefly into the detail of this nosological system, more especially as it is adopted, as a text-book, by many of the teachers of medicine at present.

Dr. Cullen arranged all the diseases of the human frame under four classes; the *first* containing the "Pyrexia," or all those affections which are called *febrile*; the *second*, "Neuroses," or affections of the nervous system, that is, "disorders of sense and motion," independently of primary fever or local disease; the *third*, "Cachexia," or those disorders which are connected with "a depraved state of the whole, or greater part of the body, without any primary fever or nervous affection;" and the *fourth*, including the "Locales," or diseases of some part of the body only.

This appears to be a sufficiently simple and natural division of the subject, and the sub-divisions are entitled, on the whole, to the same commendation. In filling up these outlines, however, by the genera and species, some difficulties occur, and some anomalies present themselves, as in every artificial classification; so that the uniformity of the principle is occasionally broken, and some hypothetical analogy is resorted to, for the purpose of reducing the irregularity to apparent order. For example, among the *local* diseases, and in the order of Dysoresia, (false or defective appetites,) most of which are referrible to diseases of the organs with which these appetites are connected, such as bulimia and polydipsia, we find the disorder termed *nostalgia*, (or a vehement desire of returning to one's native country, when absent,) which Vogel has more correctly arranged as a species of melancholy. In other cases, an anomalous disease is forced into the classification, as being the sequela or result of another; thus, the pulmonary consumption, (phthisis pulmonalis) is arranged by Dr. Cullen among the *hemorrhages*, in the class of Pyrexia, immediately following hæmoptysis, or spitting of blood, although that hæmorrhage is by no means an universal precursor of phthisis, and is commonly one of the early symptoms, and not the cause of the disease, when it actually occurs. Some other inaccuracies of a similar kind will be observed, in examining the particulars of the generic and specific classifications; but many advantages over the arrangement of Sauvages will likewise be manifest, in the same parts of the system, and especially in the condensation of several genera into one, and in the consideration of many of the species as mere varieties.

Dr. Cullen's first class, *Pyrexia*, is subdivided into five orders: the *first* of which contains the *fevers* properly so called, or idiopathic fevers; of which there are two sections, the intermittent, and continued. Of the *intermittent* fevers, Dr. Cullen makes but three genera, the tertian, quartan, and quotidian, under which he comprehends, as varieties, all the forms of intermittent and remittent fevers described by authors, the semitertians, and double tertians, the miliary and petechial remittents, and an almost innumerable catalogue of synonyms, which he has collected from their works, and referred to among the species of Sauvages. The second section, or the *continued* fevers, including three genera, synocha, or inflammatory fever, typhus, and synochus, comprise also a great number of febrile affections, which have been described under various names by authors; but perhaps even Dr. Cullen's division of the genera might be lessened. The *hectic* fever he does not admit among the genera; because he deems it invariably symptomatic of some other disease.

The *second* order of Pyrexia, entitled "Phlegmasia," comprises the acute organic inflammations, of all the viscera, membranes, and muscles; as of the eye, brain, throat, lungs,

heart, peritoneum, stomach, liver, and other viscera of the abdomen and pelvis, rheumatism, and gout. These again include their respective species; thus the cynanche, or inflammation of the throat, comprises five species; the common quinsey (*tonsillaris*), the ulcerous sore throat, which, in fact, belongs to scarlet fever (*maligna*); the croup, or inflammation of the wind-pipe (*trachealis*); inflammation of the pharynx (*pharyngea*); and the mumps, in which the inflammation extends to the parotid glands (*parotidea*). In like manner, the genus Pneumonia, inflammation of the lungs, includes the two species, peripneumony and pleurisy.

The *third* order of Pyrexia, or febrile diseases, comprehends the eruptive fevers, and is entitled "Exanthemata." It includes ten genera, small-pox, chicken-pox, measles, scarlet fever, the plague, erysipelas, the miliary rash, nettle-rash, pemphigus, and aphtha, with their species and varieties.

The *fourth* order, "Hæmorrhagia," includes epistaxis (bleeding of the nose,) spitting of blood, hæmorrhoids or piles, and menorrhagia, with consumption following the second. And the *fifth* comprises but two genera, catarrh and dysentery, being entitled "Profluvia," the discharges being naturally mucous, not bloody. The catarrh includes the common cold, the epidemic influenza, and the coughs connected with measles, and other fevers, as varieties.

Dr. Cullen's second class comprehends the "Neuroses," or "affections of the faculties of sense and motion, unaccompanied by any idiopathic fever, or local disease." This class contains four orders, Comata, Adynamia, Spasmi, and Vesanix. It must be admitted, however, that somewhat of hypothetical opinion has been engaged in the distribution of the genera and species of this class; several of which, especially in the second and third orders, are brought together rather upon fanciful grounds, than from obvious and intelligible analogy.

The *first* order of this class, "Comata," in which "the voluntary motions are impaired, together with sopor, or a suspension of the senses," is sufficiently natural, and includes two genera, closely allied to each other, viz. apoplexy, and paralysis. Dr. Cullen considered the carus, catocche, catalepsy, (which, however, he believed to be always feigned,) cataphora, lethargy, asphyxia, and ecstasis of medical writers, as different degrees or modifications of the same affection, and included them all under the genus apoplexy, as well as the acute hydrocephalus, which he termed apoplexia hydrocephalica. And, in like manner, he comprised a number of genera and species under his genus paralysis; such as the hemiplegia, paraplegia, paraplexia, paralysis, tremor, and asthenia.

The *second* order, "Adynamia," or "impaired involuntary motions," comprises four genera, which are not very obviously allied; these are syncope (fainting), dyspepsia (indigestion), hypochondriasis, and chlorosis. The genus dyspepsia is of very comprehensive import; for it includes the various modifications of stomach-complaints, which Dr. Cullen deemed but so many symptoms of dyspepsia, and not distinct diseases, as the other nosologists maintained; such are, for instance, the anorexia, cardialgia, gastralgia, flatulentia, nausea, vomitus, soda, and diaphora, of these writers.

But the *third* order, "Spasmi," which contains seventeen genera, unites diseases that have still less apparent affinity with each other, and upon very hypothetical grounds. Although tetanus, locked jaw, convulsion, chorea, epilepsy, palpitation, asthma, whooping-cough, colic, hysteria, and hydrophobia, may be properly comprehended among spasmodic affections; it is not very clear, upon what principles cholera

cholera and pyrosis are so arranged; and still less obvious, how diarrhoea and diabetes are to be deemed diseases of a spasmodic character.

The *fourth* order, "Vesania," which comprises "diseases of the reasoning faculty, independently of fever or of coma," contains four genera, amentia, (imbecility of mind), melancholy, mania, and oneirodynia; the last of which includes the somnambulism, and night-mare.

The third class, *cachectic* diseases, in which "the habit of body, either totally, or in great part, is depraved, without any primary fever or nervous disease," is divided into three orders, characterised by emaciation, enlargement, and a morbid condition of the skin.

The *first* order, "Marcores," comprises only two genera, tabes and atrophica, both which are popularly termed consumption, or decline; but the tabes is accompanied by hectic fever, and the atrophica is not.

The *second* order of cachectic diseases, "Intumescencia," is characterised by a preternatural enlargement of the whole, or some part of the body; and of these enlargements there are four kinds, adipose (fatty), flatulent, watery, and solid. Of the *fatty* swellings there is only one genus, corpulence, which, whenever it becomes so great as to occasion impediment to any of the functions of life, is truly a disease. (See CORPULENCE.) Of the *flatulent* enlargements, there are three genera, emphysema (or air contained in the cellular membrane), tympanites, (distention of the belly by air), and physometra (flatulent swelling of the womb). The *watery* or dropical swellings take place in the cellular membrane (anasarca), in the head (hydrocephalus externus), in the canal of the spine (hydrorachitis), in the chest (hydrothorax), in the abdomen (ascites), in the uterus (hydrometra), and in the scrotum (hydrocele). The *solid* enlargements are physconia, when the hard tumour is in some of the viscera of the belly, and rachitis (rickets).

The *third* order of this class, "Impetiginæ," includes scrofula, syphilis, sea-scurvy, elephantiasis, lepra, the yaws, trichoma, and jaundice.

The *fourth* and last class of Dr. Cullen's system of nosology comprehends all those disorders which are confined to a part of the body, without influencing the constitution at large,—the Morbi "Locales." The numerous genera comprised in this class are subdivided into eight orders, of which a brief account will be sufficient to explain the nature of the classification.

The *first* order, "Dysæsthesiæ," includes the instances of "depravation or total loss of some sense, occasioned by a fault of the external organ;" such as blindness from cataract, opacity of the cornea, &c.; short-sightedness, nyctalopia, &c.; deafness, loss of the smell, taste, or touch. The *second* order contains the "morbid or deficient appetites," "Dysorexiæ;" viz. canine appetite, polydipsia, pica, satyriasis, nymphomania, nostalgia, anorexia, adipia, and anaphrodisia. The *third* order, "Dyscinetiæ," comprises "obstructed or depraved motions, which arise from a disorder of the organs," viz. loss of voice, dumbness, hoarseness, stammering, squinting, difficult deglutition, and contractions of the limbs. The *fourth* order, "Apoceneses," comprehends all passive discharges, i. e. such as "are produced without fever, or any increased impetus." The genera of this order are passive hæmorrhages, colliquative sweats, flowing of tears (epiphora), salivation, involuntary discharge of urine, gonorrhœa. The *fifth* order, "Epischemes," includes the "suppression of accustomed excretions;" namely, constipation of the bowels, suppression of urine, dysuria, dyspermatismus, amenorrhœa. The *sixth* comprises "Tumours" of various nature; aneurism and

varix, affecting the arteries and veins, ecchymosis, scirrhus, cancer, bubo, sarcoma, warts, corns, ganglion, hydatids, white swelling, and exostosis. The *seventh* order, "Ectopiæ," contains three genera of tumours, occasioned by the removal of a part from its proper place; viz. hernia, prolapsus, and dislocations. And the *last* order, "Dialyses," includes the disorders in which there is a manifest solution of continuity, or broken surface; namely, wounds, ulcers, herpes, tinea, itch, fractures, and caries of bones;—a group which, it must be admitted, has scarcely any other circumstance in common, except the breach of continuity.

These imperfections, however, seem to belong to the subject; and no system of nosology has yet been devised, which has any pretensions to be free from them. It will not be necessary, therefore, to enter into any detail of the systems which have been promulgated subsequently to the publication of Dr. Cullen's; for none of these seem to possess so decided a superiority, as to have gained any general approbation; and the purposes of instruction are fulfilled with sufficient accuracy by the former.

Among the nosological systems which have appeared since the first edition of Dr. Cullen's, besides that of Sagar, of Vienna, already mentioned, was one promulgated by Dr. David Macbride, in his "Methodical Introduction to the Theory and Practice of Physic." He proposed to arrange diseases under four classes, universal, local, sexual, and infantile; a classification which appears to be liable to numerous objections, but which the author did not live to complete, having published only the orders and genera of the first class. M. Pinel, about the year 1800, published, under the title of "Nosographie Philosophique," the first three classes of a new arrangement of diseases, viz. fevers, inflammations, and hæmorrhages, which, we believe, he has not yet completed; nor has he favoured us with the general outline of his system. In filling up the genera and species, however, more especially under the head of fevers, he has multiplied the subdivisions to an extent, which sound observation does not appear to warrant; and stated differences, where he is unable to point out the practical means of distinction.

Dr. Darwin promulgated, in 1796, a new classification of diseases, which, however, was rather intended to illustrate a new system of pathology, than as a methodical nosology. It was founded upon a very original view of the principles of animal life, which were made the basis of the classification. Thus, Dr. Darwin considered the four animal faculties, irritability, sensibility, volition, and association, as being, when deranged, the causes of every disease; and, therefore, constituted four great classes of diseases, which he called diseases of irritation, of sensation, of volition, and of association. In the distribution of the genera and species, however, it was often necessary to resort to the fancy, to determine under which class certain morbid affections should be arranged; and many species, on the other hand, when ascribed to derangement of more than one of these faculties, were necessarily introduced in different parts of the classification: so that diarrhoea, for instance, may be found under almost every class. Although this classification, therefore, bears intrinsic evidence of great ingenuity, as well as of much observation of disease, and contains many practical hints of great value; yet as a system of arrangement, by which the practitioner is to be directed to the discrimination of diseases, it is perhaps altogether useless.

Before we conclude this article, we may observe, that it has been the fashion, among many professional men, to decry the study of nosology, and the method of teaching medicine upon a nosological plan. But this can have arisen only from

an imperfect acquaintance with its nature and tendency, and a consequent inadequate estimate of its utility. It is necessary, as we have observed above, that every practitioner should be enabled to distinguish diseases by their signs, or symptoms, if he would hope to cure them by appropriate remedies. He must, therefore, possess, in his own mind, an arrangement of the characteristic symptoms of every disease, and especially of the diagnostic symptoms, or those by which it is distinguished from other diseases, which resemble it, or with which it has several symptoms in common. The question, therefore, appears to be, whether it is advisable to teach medicine according to a system, in which the diagnostic symptoms are distinctly laid down, or to leave them to be learned by a vague and unmethodical course of reading and practice;—a question which seems to answer itself. We are persuaded that the great superiority, which is commonly seen in practitioners of good education, is to be ascribed, in a considerable degree, to the nosological method of studying the principles of medical science, in which they had been early initiated.

To those who have not been accustomed to consider this subject, a single illustration will perhaps demonstrate the truth of this observation. The pleurisy, for instance, or inflammation of the lungs, though marked by many symptoms which are common to fevers and other inflammations, is characterised by the invariable presence of these *four symptoms*, which constitute the nosological definition of pneumonia, given by Dr. Cullen; namely, “fever, pain in some part of the chest, difficult respiration, cough.” Now, in the absence of any one of these symptoms, however severe the others may be, pneumonia cannot be present; yet the immethodical practitioner is liable to commit serious mistakes, in respect to this disease, from a defective view of the pathognomonic symptoms. Thus, wherever there is acute pain in the chest, with difficulty of breathing, pleurisy is often supposed to exist, and blood-letting immediately resorted to. But if there is neither cough nor fever, or if there should be even cough, but the pulse should remain natural, inflammation certainly is not present, and blood-letting is unnecessary, perhaps injurious. Under such circumstances, the pain and dyspnoea originate probably from a rheumatic affection of the intercostal muscles, or from a spasmodic contraction of the same organs, or of the diaphragm; and, therefore, the appropriate remedy will be an opiate, or other antispasmodic, aided by some external stimulant; yet if there be actual inflammation present, and the disease is treated with opium and stimulants, much serious mischief will be produced. Again, cough and fever may occur together, and be accompanied even by some degree of oppression of the respiration; yet, if there is no pain in the thorax, there is no active inflammation of the lungs; the cough is, in this case, probably a secondary or accidental symptom, and the fever may be totally independent of it, and of such a type, that blood-letting, employed under the supposition of removing inflammation, might irrecoverably depress the strength of the patient. Against such important practical errors the mind is most effectually secured, when it is stored with correct nosological views: for, where these are absent, the practitioner is apt to proceed upon a mere empirical association of certain remedies with certain prominent symptoms, without duly marking their combinations, or weighing their import, that is, without forming any clear opinion as to the actual seat and nature of the disease.

NOSOVSKOI, in *Geography*, a cape on the east coast of Nova Zembla. N. lat. $77^{\circ} 15'$. E. long $64^{\circ} 14'$.

NOSS HEAD, a cape on the east coast of Scotland, in the county of Caithness. N. lat. $58^{\circ} 26'$. W. long. $2^{\circ} 5'$.—

Alfo, a cape on the north coast of Noss island. N. lat. $60^{\circ} 13'$. W. long. $1^{\circ} 5'$.

Noss *Island*, one of the smaller Shetland islands. N. lat. $60^{\circ} 12'$. W. long. $1^{\circ} 5'$.

NOSSA Senhora de Encarnação, a town of Portugal, in Algarve, situated near cape Carveiro, on the south-west; 4 miles S. of Villa Nova da Portimao.

NOSSANO, a town of the republic of Lucca; 6 miles W. of Lucca.

NOSSEN, a town of Saxony, in the circle of Erzgebürg, on the Muldau; 12 miles S.W. of Meissen. N. lat. $51^{\circ} 13'$. E. long. $13^{\circ} 11'$.

NOSTALGIA, in *Medicine*, from *νοστέω*, to return, and *αλγος*, pain or grief, is a species of melancholy, the leading circumstance of which is a vehement and unceasing desire to return home, and which of course occurs only in persons who are absent from their friends and native country.

This affection is called by the French *maladie du pays*, and by the German-Swiss *heim-weh*, or home-grief. Zwinger, who wrote a dissertation upon the subject, denominated it *nostomania*, and *pothopatridalgia*. Sauvages, and, after him, Dr. Cullen, have, by a singular strained analogy, placed this disease among the morbid appetites, in the class of *local diseases*, in their respective systems of nosology; as if there were a particular organ in the body, in which the *amor patriæ* is seated, like hunger and thirst in the stomach. See Sauvages, class viii. gen. 11. Cullen, class iv.

This disease has been observed to be particularly frequent in the inhabitants of mountainous countries, which are in a state approaching to the pastoral condition of society, and with which the local associations, early impressed on the mind, are stronger than those excited in less picturesque countries. Hence the Swiss have always been remarkable for their tendency to fall into this species of melancholy; and great numbers have been induced to desert from the armies of foreign states, in which they have been enrolled as mercenaries. The Swiss guards, employed by the kings of France, have been particularly remarkable from this circumstance; and they have been observed to be seized with this malady, more especially, on hearing a national air, “Ranz des vaches,” which is sung to a ballad, containing allusions to their home, relations, and domestic animals; an air, however, which has nothing peculiarly pleasing in its melody, to those who connect with it no particular association of ideas.

The disease, however, is by no means peculiar to the Swiss, or other mountaineers; but occurs among a much injured people, who have been supposed incapable of enjoying happiness in their own way, or of feeling attachment to their country. “Nostalgia, maladie du pays, or an ardent desire to revisit one’s native home,” Dr. Winterbottom observes, “is a disease which affects the *natives of Africa*, as strongly as it does those of Switzerland: it is even more violent in its effects on the Africans, and often impels them to dreadful acts of suicide. Sometimes it plunges them into a deep and incurable melancholy, which induces the unhappy sufferers to end a miserable existence by a more tedious, though equally certain, method, that of dirt-eating. No reader of sensibility can peruse, without emotion, Haller’s impassioned regret for the calm retreat of Kasel; but even Haller’s glowing language appears cold and lifeless, if compared with the agonizing expressions of distress poured out by the poor African, when, waking from the sleep in which delusive fancy had wafted him back to his friends and much loved home, he finds only the cruel mockery of a dream.” Account of the native Africans of Sierra Leone, vol. ii. p. 174.

The severe and consuming influence of this mental affection on the body, and the train of symptoms, tending to fatal marasmus, which it induces, if not interrupted, as well as the speedy and not less remarkable corporeal amendment, which the removal of the mental depression occasions, will be best illustrated by the relation of a case, which occurred in this country.

"In the year 1781," says Dr. Hamilton of Ipswich, "while I lay in barracks at Tynemouth, in the north of England, a recruit, who had lately joined the regiment, (named Edwards,) was returned in the sick list, with a message from his captain, requesting I would take him into the hospital. He had only been a few months a soldier, was young, handsome, and well-made for the service; but a melancholy hung over his countenance, and wane preyed on his cheeks. He complained of universal weakness, but no fixed pain; a noise in his ears, and giddiness in his head; pulse rather slow than frequent, but small, and easily compressible. His appetite was much impaired; his tongue was sufficiently moist, and his belly regular; yet he slept ill, and started suddenly out of it, with uneasy dreams. He had little or no thirst.

"As there were little obvious symptoms of fever, I did not well know what to make of the case. I suspected he might be under an incipient typhus, and ordered what I judged necessary to obviate it. Some weeks passed with little alteration either for better or worse, excepting that he was evidently become more meagre. He scarcely took any nourishment, yet had hitherto sat up out of bed some hours every day. At length he became indolent, seldom sat up at all, was constantly dozing, yet his sleep never so sound but he could answer when spoken to: he sighed deeply and frequently; nor could his attention be directed to any external object. Something, it would seem, hung heavy on his mind. He never had any cough; yet, since he came into the house, he had wasted away considerably. Exercise was recommended, and used as far as he could be roused to take it, which was never without reluctance. He was put on a course of strengthening medicines, and wine was allowed him. All proved ineffectual. His pulse had changed with his appearance, and was now small and quick: an evident fever, of the hectic kind, with an evening exacerbation, took place. He had now been in the hospital near three months, and was quite emaciated, and like one in the last stage of a consumption. His eyes were grown hollow, cheeks prominent, nails incurved, adnata pellucid; and he was so weak in his limbs, that he could neither get in nor out of bed without help. Of late, also, he had night sweats. In short, I looked on him as lost.

"On making my morning visit, and inquiring, as usual, respecting his rest of the nurse, she happened to mention the strong notions he had got in his head, she said, *of home, and of his friends*. What he was able to speak was constantly on this topic. This I had never heard before. The reason she gave for not mentioning it was, that it appeared to her to be the common ravings of sickness and delirium. He had talked in the same style, it seems, more or less, ever since he came into the hospital.

"I went immediately up to him, and introduced the subject; and, from the alacrity with which he resumed it, (yet with a deep sigh, when he mentioned his never more being able to see his friends,) I found it a theme which much affected him. He asked me, with earnestness, if I would let him go home. I pointed out to him how unfit he was, from his weakness, to undertake such a journey, (he was a Welshman,) still once he was better; but promised him, assuredly, that as soon as he was able, he should have six weeks to go

home. He revived at the very thoughts of it."—"It seems he had requested leave to visit his native place, soon after he joined; but being only a recruit, and but a few months from thence, he was refused. This had hung on his spirits ever since; and from thence I now dated the origin of his illness. I intreated him to take food, to strengthen him for his journey; and, as soon as he was able, to go out into the open air a little every afternoon, when the weather would permit, that he might be the sooner able to go home. He listened eagerly to every word I said. In short, his appetite soon mended; and I saw, in less than a week, evident signs of recovery. He was now lively, though so weak that he could not get in or out of bed without assistance: he strove to sit up: two men took him between them, in the heat of the day, and placed him on a seat they had erected for him on the beach, where he had a view of the shipping. In a little time he was able to walk. Every visit I paid him, he resumed the subject of *the furlow*, which I persisted in promising, seeing the good effects it had already produced; and, in less than two months from the time he had received this promise, he was able to leave the hospital and go to his barrack-room." See Edin. Med. Commentaries, vol. xi. p. 343.

Under this state of debility of body, and melancholy brooding of the mind upon the recollections of *home*, it will readily be conceived how even despair, and suicide, may be the result of the violent emotions excited by hearing a national tune, or by any other impression, which, by the associated feelings and remembrances that it recalls, brings to the view of the individual the subject of his morbid contemplations. And it will be not less evident, from the consideration of the preceding case, that the employment of physical expedients to support the strength, and to correct the hallucinations of the mind, will be totally fruitless, until the cordial of hope and expectation be afforded. See Zwingerus Diss. Med. Harder Diss. de Nostalgia, in Haller's Disputationes, tom. i. xi.

NOSTOC, in *Botany*, a cryptogamic plant, *Tremella Nofoc* of Linnæus and his followers, Engl. Bot. t. 461, is a roundish, leafy, inflated, plaited production, of an olive green colour, and gelatinous substance, found in pastures, and on paths, after rainy weather, soon drying and shrivelling up to almost nothing. The name of *Nofoc* is said to have been given by Paracelsus, and he is reported, by Tournefort and Geoffroy, to have attributed wonderful properties to this vegetable, and to have expected to obtain from it that universal solvent, which was one of the great objects of the chemists of his school. Geoffroy analyzed it, as he did all the plants that came in his way, to little purpose, except to prove that such an analysis, with a view to a detection of the medical uses of plants, ascertains nothing. Whether the attention of Paracelsus was called to this plant, by the vulgar opinion of its being the remains of a fallen star, or of a Will-of-the-wisp, does not appear. Dillenius justly complains, that the above French writers have not told us where that famous quack or his disciples speak of it. Some have thought it a gelatinous deposition from the clouds, when they touch the hills; of which notion a curious instance is recorded by Linnæus in his Lapland Tour, v. i. 262, where two divines wanted only the power, as they were plentifully stocked with the malice, of inquisitors, to broil him alive for not believing this, and other similar philosophy. Sometimes this plant, sometimes *Tremella arborea*, Engl. Bot. t. 2448, is called witches' butter. In short, there have always been some wonderful or superstitious ideas attached to it, which might long ago have died away, had not the mistakes of recent philosophers tended to embroil rather than

than elucidate the subject. Certain chemists, in pursuit of this vegetable for their investigation, being but indifferent naturalists, appear to have mistaken for it substances of a very different kind. Dr. Withering observes that the remains of frozen frogs, after a hard winter, bear a great resemblance to a *Tremella*, and may easily be mistaken for the *Nosloc*, except that some of their bones may frequently be detected in it. Others have asserted that the Heron often disgorges a substance of the same nature and appearance. No wonder that chemists who fell upon these, instead of the real *Nosloc*, proved them to be of an animal nature! The writer of this was assured by a friend and companion, of the celebrated Spallanzani, that some of his experiments, at least, upon the same subject, were made with young aquatic snails, that had not yet acquired shells, in the aqueduct at Genoa, and that he rejected with much contempt the information of their being such, and not a real *Tremella*, though a little attention would have enabled him to trace the animals through their various states, on the spot, from an apparently inert gelatinous mass, like a plant, to their complete perfection. What we read therefore, in various places, relative to the animal nature of *Tremella Nosloc*, should be received with caution, till we ascertain whether those who investigated the subject were competent to know what they were examining. As to the genuine *Nosloc*, Geoffroy and Reaumur long ago determined its vegetable nature. Micheli describes its seeds as ranged in lines, like strings of minute beads; but we never heard of such being observed in any British specimens. S.

NOSTRE, or **NOTRE**, **ANDREW LE**, in *Biography*, an eminent planner of gardens, was born at Paris in the year 1613. He was the son of a gardener, and succeeded his father in that employment. He probably received little or no education, and was about 40 years of age when he was brought into notice by the superintendant Fouquet, for whom he laid out the magnificent gardens of Vaux-le-Vicomte, celebrated by La Fontaine in his poems. In this work he was the creator of those porticoes, covered walks, grottoes, labyrinths, &c. in which, at that period, the wonders of ornamental gardening consisted. Lewis XIV., charmed with the magnificence of Le Nostre's plans, employed him in the decoration of his favourite residences; and his art was accordingly displayed at Versailles, Trianon, Fontainebleau, &c. Le Nostre went to Rome in 1678, and afterwards travelled through Italy; and it is said he found nothing in the most celebrated gardens, that he had not devised in those of his own planning. He was some time in England, and, probably on the invitation of Charles II., laid out St. James's and Greenwich parks. In 1675, when he was again in France, his long services were rewarded by letters of noblesse, and the cross of St. Michael. The king would have given him a coat of arms, but he replied that he had one already, "consisting of three snails surmounted by a cabbage." At the age of four-score he desired permission to retire, which the king granted him, on condition that he would sometimes come and see him. He died at Paris, in 1700, at the age of 87. He is said to have had a fine taste for the arts in general, especially for that of painting; and some pieces of his execution are mentioned as existing in the royal cabinet. Moreri.

NOSTRILS, the openings of the nose in a horse. These should be large and extended, so that the red within them may be perceived, especially when he sneezes.

NOSTRILS, *Nares*. See **NOSE**.

NOSTRILS of Birds. See *Anatomy of BIRDS*.

NOSTRILS of a Fish. See **FISH**.

NOSTRILS, *Slitting of the*, in *Law*. See **MAHIM**.

NOT GUILTY, the general issue or plea of the defendant, in any criminal action. See **NON EST CULPABILIS**.

NOTABILIA BONA. See **BONA**.

NOTÆ MATERNÆ, *Mother's Spots*. See **NÆVUS**.

NOTARICON, the third part or species of the Jewish Cabala.

Rabbi Nathan, in his *Great Aruch*, says, that notaricon is when a single letter is taken for the sign of a thing, *i. e.* for a whole name. He adds, that the word comes from the Latin *notarius*, a person who writes in notes, or short-hand; and R. Elias Levita gives the same account in his *Thefbites*; except that, in lieu of one letter for a word, he mentions two or three.

But, after all, neither the one nor the other seems alone sufficient; for, as a single letter frequently makes a word, so, in the notaricon, a whole word sometimes stands for a single letter.

There are, therefore, two principal kinds of notaricon: the first is, when, by aphæresis, or apocope, the first or last letters of several words are joined to make a single word or phrase; which, therefore, is of two kinds, the one initial, the other final; and each is done several ways. The first of these kinds, which the rabbins call *Rasche Theboth*, appears very ancient; and is supposed, by some, well versed in the Hebrew, to have taken its origin from the Psalms, and other places of Scripture, proceeding alphabetically, *i. e.* the first verse beginning with א, the first letter of the alphabet; the second with ב, the second letter, &c. See **ABCEDARY**.

The second kind is also very common, and is called *Sophe Theboth*, *i. e.* the end of words. For instance; by telling the last letters of the words מִיִּשְׁמֹחִי, *Mibi, quodnam nomen est? Quodnam?* They find the name of God, Jehovah. This becomes still more puerile, when they take the letters backwards.

The third kind is more modern, and is more gross and perplexed. Here a letter gives a whole word, instead of a word's only giving a letter; so that a word shall furnish a whole phrase.

Thus, for example, in the first word of Genesis, בְּרֵאשִׁית, *berefcbit*, is found. He created the heaven and the earth, the sea, the abyfs, &c.

NOTARY, **NOTARIUS**, primarily denotes one who takes notes, or short draughts, of contracts, or other instruments.

From the 44th Novel of Justinian it appears, that contracts were first written in notes, or abbreviations, by the notaries, or clerks of the tabelliones, and were not yet obligatory. Afterwards they were ingrossed, or written at length by the tabellio himself, and then signed and sealed.

NOTARY is more particularly used to denote an officer who draws and keeps notes and minutes of contracts, obligations, and other instruments, executed before him; and delivers out authentic copies, &c. thereof.

Ragueau distinguishes between *notarii* and *tabelliones*: notaries, he says, in several cities, are only to receive and pass the minutes of contracts, and to deliver them to the parties in brief; being obliged to carry them to the tabelliones to be kept, and to have ingrossed copies delivered out to the parties.

He adds, that the notaries were anciently clerks of the tabelliones; and that separating, by degrees, from their masters, they at length erected offices of their own; and, at last, took place of the tabelliones, who were suppressed.

They had their name *notarii* from *notæ*; because anciently they wrote in notes, or short-hand.

Notaries

Notaries are now little used among us, except in mercantile affairs; though in France they still subsist in their legal capacity. The notaries of the chatelet are called the king's counsellors, and note-keepers.

NOTARY, Public, among us, is a person who draws, and publicly attests deeds or writings, between merchants, to make them authentic in another country.

Notaries have the drawing, passing, keeping, issuing, &c. of all deeds, contracts, charter-parties, &c. in the mercantile world. In their books are registered protests, remonstrances, &c. See **NOTE** and **BILL**.

A notary public is appointed to this office by the archbishop of Canterbury, and the appointment is to be registered and subscribed by the clerk of his majesty for faculties in Chancery. By 41 Geo. III. cap. 7. it is enacted, that from and after August 1, 1801, no person shall be sworn, admitted, and enrolled as a public notary, unless such person has served seven years as clerk or apprentice, &c. nor perform any notarial act, without such admission and enrollment, &c. under a penalty of 50*l*. The admission of a notary shall be upon a 30*l*. stamp, and every notarial act shall be on a 5*s*. stamp.

NOTARIES, Ecclesiastical, were officers in the first ages of the church, whose business was to collect and preserve the acts of the martyrs.

They are supposed to have been first instituted by St. Clement. Their number was seven, and they were disposed in the seven quarters or regions of Rome.

Pope Fabian, judging the short-hand of the notaries too obscure for common use, added seven subdeacons to them, to transcribe at length what the notaries drew in short.

At length these notaries were laid aside, and two other kinds were established in their stead, *viz.* *apostolical* notaries, and *episcopal* notaries; whose business lies in spiritual and beneficiary instruments.

NOTATION, in a general sense, implies the representing of any number, quantity, dimension, or operation by means of certain symbols or characters.

NOTATION, in *Arithmetic*, is the method of expressing, by means of certain symbols or numeral characters, any proposed number or quantity. In the common scale of notation, every number is expressed by means of the ten characters or digits 0, 1, 2, 3, 4, 5, 6, 7, 8, 9, which representation is effected by giving to each digit a local as well as its proper numeral value, the invention of which method, simple as it now appears, is perhaps one of the most important improvements that has ever been made in the mathematics, and does its author as much honour as any discovery recorded in the history of these sciences. To whom we are indebted for the advantages arising from this method is not known, nor even the nation whence it had its origin; some having attributed the invention of it to the Arabs, others to the Greeks, and others again to the Indians; which latter people have certainly a priority of claim to the two former; but whether they were the original inventors, or whether they borrowed their notion of it from any other nation, is at present, and probably ever will remain undecided.

The simplicity of this method, and the universal application of it to every species of calculation, render it so familiar to all our ideas of numbers, that we lose sight of the ingenuity and advantage of it by means of that which ought to render it more the object of our admiration; that is, the obvious and accurate principles upon which it is founded; and instead of considering it as a most ingenious discovery, we are apt to treat it as a necessary consequence following immediately from the nature of number itself. That this, however, is a mistake is evident, from the notation of the Greeks and Romans, to whom this method was

unknown: in fact it does not appear to have been introduced into Europe before the latter end of the tenth century, when it was first taught by the Arabs to the Spaniards, with whom they had a communication, and hence it soon after became generally known amongst the other European nations, though it does not appear to have been brought into use in England before the year 1150.

It is evident from several manuscripts of the Arabs which are still preserved, that they derived their knowledge of it, either directly or indirectly, from the Indians, it being entitled, in some of their works, the "Indian Arithmetic." With regard to the characters or digits by which numbers are now almost universally expressed, they seem to be the same, with a very slight alteration, as those that were originally employed for that purpose; but their forms are not such as to throw any light upon their origin, though some authors, who have discovered more ingenuity than judgment, have endeavoured to trace them to the Greek alphabet, and hence inferring, contrary to every evidence, a Grecian origin to our present system of notation. Montucla has given us, in the 11th plate of the first volume of his "Histoire des Mathematiques," a representation of the several arithmetical characters, as they have been employed by different early writers; and as these may be interesting to many of our readers, we have given the same in *Plate Notation* of the present work.

In the common, or denary scale of notation, the value of every digit increases from the right hand towards the left in a tenfold proportion; thus 11111 is the same as 10000 + 1000 + 100 + 10 + 1, and so on for others; the distance of any figure from the right indicating the power of 10, and the digit itself the number of those powers intended to be expressed, on which obvious principle it is evident, that any number whatever may be represented with ease and simplicity. But since any other number or radix might have been assumed instead of 10, the curious reader will enquire how it happened that this in particular should have been selected as the almost universal radix by nations totally unconnected and unknown to each other, even in many rude nations, particularly amongst the inhabitants of the islands in the South sea, who have scarcely any notions of a regular system of arithmetic, yet have a method of dividing their numbers into periods of tens, and the same has been observed with regard to the natives of New Holland and some other newly discovered countries. This singular coincidence between nations totally unknown to each other has given rise to many philosophical speculations, from the time of Aristotle to the present day, though it seems to be now universally supposed to have had its origin in the formation of man; that is, to the circumstance of his possessing ten fingers, by the aid of which, in all probability, calculation, or at least numbering, was first effected; as we see children, in making their first efforts in computation, have recourse to this means of assisting their memories, and hence we may infer, that the present division of numbers into periods of tens had its origin as soon as numbering was first attempted, that is, as soon as men began to associate with each other. But it must not thence be inferred, that the mode of notation in present use followed necessarily from this division; of the contrary of which we may be convinced by attending to the arithmetic of the Greeks, who, notwithstanding they made use of the same division, had no idea of our present notation. Such, however, being the case with regard to the division of numbers, the choice of the radix 10 was the most natural that could have been selected, though it was not the best adapted to arithmetical calculations, 12 being much better suited for this purpose: the advantages of it,

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however, are not such as to lead us to expect, or even to wish that it should ever be substituted for that which long established custom has rendered so familiar to all our ideas of numbers. But though not the best, the present scale, with the exception of the duodenary, is the most eligible that could have been devised, and as convenient as can be desired; it will, therefore, not be amiss to investigate the principles on which it is founded, and the advantages and disadvantages of it, compared with other systems; in doing which we shall avail ourselves of an interesting chapter on this subject in Barlow's Theory of Numbers.

PROP. I.

Every number, N , may be reduced to the form $N = ar^n + br^{n-1} + cr^{n-2} + \&c. pr^2 + qr + w$; where r may be any number whatever, and $a, b, c, \&c.$ integers less than r .

For let N be divided by the greatest power of r contained in it, as r^n , and let the quotient be a , and remainder N' ; so that

$$N = ar^n + N'.$$

Divide, again, N' by the next lower power of r , as r^{n-1} , and let the quotient be b , which will be an integer, or zero, as $N' >$ or $< r^{n-1}$, and the remainder N'' , whence

$$N = ar^n + br^{n-1} + N''.$$

Dividing, again, N'' by r^{n-2} , and supposing the quotient c , and remainder N''' , we have

$$N = ar^n + br^{n-1} + cr^{n-2} + N'''.$$

And by thus continually dividing the remainder by the next lower power of r , we shall be evidently brought finally to the form

$$N = ar^n + br^{n-1} + cr^{n-2} + \dots + pr^2 + qr + w,$$

in which expression, as $a, b, c, \&c.$ are the quotients arising from the division of a number by the highest power of r contained in that number, it necessarily follows that each of those co-efficients $a, b, c, \&c.$ is less than r .

Cor.—If $r = 10$, then $a, b, c, \&c.$ are the digits by which any number is expressed in our common method of notation; thus,

$$76034 = 7 \cdot 10^4 + 6 \cdot 10^3 + 0 \cdot 10^2 + 3 \cdot 10 + 4$$

$$18461 = 1 \cdot 10^4 + 8 \cdot 10^3 + 4 \cdot 10^2 + 6 \cdot 10 + 1$$

which form is always understood in enumerating the value of any number proposed; that is, we give to every digit a local, as well as its original or natural value; thus, in the number 76034, the second digit from the right is 3, but we consider it as representing 30, on account of its local situation, being in the second place from the right; in the same manner the 6 represents 6000, and the 7, 70,000; so that the value of each digit is estimated according to its local situation, and its original value, the former indicating the power of 10, and the latter the number of those powers that are intended to be expressed.

Cor. 2.—It is evident, from the foregoing proposition, that a number may be in the same manner represented by any other value of the radix r , and hence arise the different scales of notation, which receive the following particular denominations according to the value of the radix:

If $r = 2$	it is termed the	Binary scale,
$r = 3$	- - -	Ternary,
$r = 4$	- - -	Quaternary,
$r = 5$	- - -	Quinary,
$r = 6$	- - -	Senary,
$r = 10$	- - -	Denary or common scale,
$r = 12$	- - -	Duodenary.

And since, by the foregoing proposition, $a, b, c, \&c.$ are always less than r , the radix of the system into which they enter, therefore it follows that for every scale we must have as many characters, including the cipher, as are equal to the number expressing the radix of the system. Thus for the

Binary scale, the characters are 0, 1.

Ternary - - - 0, 1, 2.

Quaternary - - - 0, 1, 2, 3.

Senary - - - 0, 1, 2, 3, 4, 5.

Denary or common scale 0, 1, 2, 3, 4, 5, 6, 7, 8, 9.

And hence it follows, that in the duodenary scale, we must have two additional characters for representing 10 and 11, and as these characters may be assumed at pleasure, we shall, in what follows, express 10 by the symbol ϕ , and 11 by π , whence the digits of the duodenary scale will be

0, 1, 2, 3, 4, 5, 6, 7, 8, 9, ϕ , π .

PROP. II.

Given the equation

$$N = ar^n + br^{n-1} + cr^{n-2} + \dots + pr^2 + qr + w,$$

in which N and r are given numbers, to find the unknown co-efficients the $a, b, c, \&c.$; and the exponent n . Or, which is the same, to transform a number from the denary to any other scale of notation.

It is evident that this may be done by Prop. I., namely, by dividing N successively by the highest power of r which is contained in it, but it is more readily performed by dividing N successively by r ; thus, if

$$N = ar^n + br^{n-1} + cr^{n-2} + \dots + pr^2 + qr + w$$

be divided by r , the quotient will be

$$ar^{n-1} + br^{n-2} + cr^{n-3} + \dots + pr + q$$

and the remainder w .

This last quotient, being again divided by r , gives for a quotient

$$ar^{n-2} + br^{n-3} + cr^{n-4} + \dots + p$$

and a remainder q . And this quotient, divided by r , gives a quotient

$$ar^{n-3} + br^{n-4} + cr^{n-5}$$

and a remainder p .

Whence it is evident that the successive remainders will be the co-efficients $w, q, p, \&c.$, or the digits that express any number in the scale of which r is the radix.

Example 1.—Given $17486 = a \cdot 6^n + b \cdot 6^{n-1} + c \cdot 6^{n-2} + \dots + w$, to find $a, b, c, \&c.$ Or, which is the same, convert 17486 from the common to the senary scale.

Here, by the foregoing proposition,

$$6) \ 17486$$

$$6) \ 2914 \quad - 2 = w$$

$$6) \ 485 \quad - 4 = q$$

$$6) \ 80 \quad - 5 = p$$

$$6) \ 13 \quad - 2 = c$$

$$6) \ 2 \quad - 1 = b$$

$$0 \quad - 2 = a$$

Therefore, 17486, in the denary scale, is expressed by 212542 in the senary.

Example

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Example 2.—Transform 1810 into both the binary and ternary scales.

2) 1810	3) 1810
2) 905 — 0	3) 603 — 1
2) 452 — 1	3) 201 — 0
2) 226 — 0	3) 67 — 0
2) 113 — 0	3) 22 — 1
2) 56 — 1	3) 7 — 1
2) 28 — 0	3) 2 — 1
2) 14 — 0	0 — 2
2) 7 — 0	
2) 3 — 1	
2) 1 — 1	
0 — 1	

Therefore, 1810 = 11100010010 in the binary scale; and 1810 = 2111001 in the ternary scale.

Example 3.—Transform the two numbers 844371, and 215855, from the denary to the duodenary scale.

12) 844371	12) 215855
12) 70364 — 3	12) 17987 — 11 = 7
12) 5863 — 8	12) 1498 — 11 = 7
12) 488 — 7	12) 124 — 10 = 4
12) 40 — 8	12) 10 — 4 = 4
12) 3 — 4	0 — 10 = 4
0 — 3	

Hence 844371 is expressed by 348783 in the duodenary scale, and 215855 by 44777.

And thus a number is readily transformed from the denary, to any other system of which the radix is given, and hence we find 1000 is expressed in the following manner, according to the value of the radix r .

If $r = 2$, 1000 =	1111101000
$r = 3$, 1000 =	1101001
$r = 4$, 1000 =	33220
$r = 5$, 1000 =	13000
$r = 6$, 1000 =	4344
$r = 7$, 1000 =	2626
$r = 8$, 1000 =	1750
$r = 9$, 1000 =	1331
$r = 10$, 1000 =	1000
$r = 11$, 1000 =	828
$r = 12$, 1000 =	674

Hence it is evident, as it is, indeed, from the nature of the subject under investigation, that the greater the radix is, the less will be the number of digits necessary for expressing any given number, but the operations of multiplication,

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division, &c. will be the more complex; and therefore, in judging of the advantages and disadvantages of different systems, we ought to keep both these circumstances in view, as also a third, which is the number of prime divisions of the radix, and on a just estimate of the whole, the radix 12 will be found preferable to any of the other systems: but on this subject we shall add a few remarks at the conclusion of this article.

PROP. III.

To transform a number from any other scale of notation to the denary, or common scale.

This proposition is the converse of the foregoing one, and it is readily effected by the reverse operation.

For let $ar^n + br^{n-1} + cr^{n-2} + \dots + pr^2 + qr + w$, represent a number in any known scale of notation, whose radix is r ; then since a, b, c , &c. are also known, we have only to collect the successive values of the different terms, and their sum will be the number transformed as required.

Example 1.—Transform 7184 from the duodenary to the common scale of notation. First,

$$7184 = 7 \cdot 12^3 + 1 \cdot 12^2 + 8 \cdot 12 + 4.$$

Therefore we have

$$\begin{array}{r} 7 \cdot 12^3 = 12096 \\ 1 \cdot 12^2 = 144 \\ 8 \cdot 12 = 96 \\ 4 = 4 \end{array}$$

$$\text{Duodenary } 7184 = 12340$$

Example 2.—Transform 1534 from the senary to the denary scale.

$$\begin{array}{r} 1534 = 1 \cdot 6^3 + 5 \cdot 6^2 + 3 \cdot 6 + 4 \\ 1 \cdot 6^3 = 216 \\ 5 \cdot 6^2 = 180 \\ 3 \cdot 6 = 18 \\ 4 = 4 \end{array}$$

$$\text{Senary } 1534 = 418 \text{ in the common scale.}$$

Cor.—By means of the two foregoing propositions, a number may be transformed from one scale of notation to another, neither of which is the denary, by first transforming it from the given scale to the common scale, and then into the particular one required.

PROP. IV.

In every scale of notation where radix is r , the sum of all the digits expressing any number when divided by $n - 1$; will leave the same remainder as the whole number divided by $r - 1$. That is, if

$$N = ar^n + br^{n-1} + cr^{n-2} + \dots + pr^2 + qr + w,$$

then will $N \div (r - 1)$, leave the same remainder as

$$(a + b + c + \dots + p + q + w) \div (r - 1).$$

For make $r - 1 = r'$, or $r = r' + 1$, then $r^n \div (r - 1) = (r' + 1)^n \div r'$ will leave a remainder 1, because every term of the expanded binomial $(r' + 1)^n$, is divisible by r , except the last, which is 1, and consequently $(r' + 1)^n \div r'$, or $r^n \div (r - 1)$, will leave a remainder 1, and this property is entirely independent of the value of n ; and hence it follows, that every power of r , divided by $r - 1$, will leave a remainder 1, or each of the powers r^n, r^{n-1}, r^{n-2} , &c.

X

is

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is of the form $m(r-1) + 1$; that is, $r^0 = m(r-1) + 1$, whatever integer value is given to ϕ : and hence it follows, that

$$\begin{aligned} ar^n &= am(r-1) + a \\ br^{n-1} &= bm'(r-1) + b \\ cr^{n-2} &= cm''(r-1) + c \\ &\&c. \quad \&c. \\ pr^2 &= pm'''(r-1) + p \\ qr &= qm^{iv}(r-1) + q \\ w &= \end{aligned}$$

and consequently

$$N = m^v(r-1) + (a + b + c + \dots p + q + w)$$

and, therefore, when divided by $r-1$, it will evidently leave the same remainder as the sum of its digits ($a + b + c$ and w).

Cor. 1.—Hence, if the sum of the digits in any system of notation be divisible by $r-1$, the number is divisible by $r-1$; therefore, in the common scale, if the digits of a number be divisible by 9, the number itself is divisible by 9; and if the sum of the digits be even, and divisible by 9, then will the number itself be divisible by 18; because if an even number be divisible by an odd number, it is divisible by double that number. And since 3 is a factor of 9, the same property that has been shewn to belong to the number 9, belongs also to 3; namely, if the sum of the digits of a number be divisible by 3, the number itself is divisible by 3; and if the sum be even also, then will the number be divisible by 6.

Cor. 2.—It is upon this obvious principle that our rule for proving the truth of operations in multiplication, division, &c. is founded, by dividing by, or casting out the 9's contained in the two factors, and the product, and what remains of this last, ought to be equal to what remains of the product of the two former remainders divided by 9, if the work be right.

For let a and b represent any two factors, and make

$$\begin{aligned} a &= 9n + a' \\ b &= 9m + b' \end{aligned}$$

then $ab = 9(9nm + ma' + nb') + a'b'$; and, therefore, $ab \div 9$, leaves the same remainder as $a'b'$ divided by 9: but the remainder of a by 9, is the same as the digits of a by 9, and the remainder of $b \div 9$, is the same as the digits of b by 9, and the same of the product ab ; and hence the reason of the rule. The same is obviously true for any other system of notation, by taking the number next less than the radix for the divisor. Thus, for example, we have seen that $215855 = \phi 4\phi\gamma\gamma$ in the duodenary scale, and $215855 \div 11$, leave a remainder 2, but $\phi + 4 + \phi + \gamma + \gamma = 10 + 4 + 10 + 11 + 11 = 46$, which divided by 11 gives also a remainder 2. Suppose it was required to multiply $\phi 4\phi\gamma\gamma$ by $\phi\phi 4$, the operation and proof would stand thus:

Operation.

$$\begin{array}{r} \phi 4\phi\gamma\gamma \text{ rem. } 2 \\ \phi\phi 4 \text{ rem. } 2 \end{array}$$

$$\begin{array}{r} 3577\gamma 8 \\ 8811\gamma 2 \\ 8811\gamma 2 \\ \hline 95088918 \text{ rem. } 4 \end{array}$$

Proof by 11.

$$\begin{array}{r} 4 \\ 2 \times 2 \\ 4 \end{array}$$

It is unnecessary to observe, that in this operation, as in

all others in which the radix is r , we must, in multiplying, dividing, &c. divide by the radix, that is, by 12 in the above example, and set down the overplus, instead of dividing by 10, and setting down the overplus, as is done in the common scale.

PROP. V.

In any scale of notation whose radix is r , the difference of the remainder of the sum of the 1st, 3d, 5th, &c. digits divided by $r+1$, and the sum of the 2d, 4th, 6th, &c. digits, divided also by $r+1$, is equal to the remainder of the whole number divided by $r+1$.

Let $N = ar^n + br^{n-1} + cr^{n-2} + \dots pr^2 + qr + w$; then will the remainder of $(w + p + b, \&c.) \div r+1$, minus the remainder of $(q + c + a, \&c.) \div r+1$, be equal to the remainder of $N \div r+1$.

For make $r+1 = r'$, or $r = r' - 1$, then it is evident

that $\frac{(r'-1)^n}{r'}$ will leave a remainder $+1$, or -1 , according as n is even or odd; for all the terms in the expanded binomial $(r'-1)^n$ are divisible by r' , except the last, which is $+1$ or -1 , according as n is even or odd, independently of any other value of n ; and, therefore, $\frac{r^n}{r+1}$

will also leave the same remainder in the same cases; that is, every odd power of r is of the form $m(r+1)$, and every even power of r is of the form $n(r+1)$. Therefore, in the above expression, we have

$$\begin{aligned} w &= & + w \\ qr &= & qm(r+1) - q \\ pr^2 &= & pn(r+1) + p \\ cr^{n-2} &= & cm'(r+1) - c \\ br^{n-3} &= & bn'(r+1) + b \\ ar^n &= & am''(r+1) - a \\ &\&c. & \&c. \end{aligned}$$

And consequently,

$$N = m'''(r+1) + w - q + p - c + b - a;$$

and, therefore, when divided by $r+1$, it will leave the same remainder as $(w - q - p - c + b - a)$ divided by $r+1$, or as $(w + p + b, \&c.) \div (r+1) - (q + c + a, \&c.) \div (r+1)$.

Cor.—Hence, in the common scale, if the sum of the digits in the odd places is equal to the sum of those in the even place; or, if one exceed the other by 11, or any multiple of 11, the whole number may be divided by 11.

Cor. 2.—The above proposition furnishes us with another rule for proving the truth of the operation in multiplication, division &c. which, in the common scale of notation, the radix being 10, is as follows.

From the sum of the digits in the 1st, 3d, 5th, &c. places, subtract those in the 2d, 4th, 6th, &c. places in both factors, and in the product; also reserve the three remainders, when each of those differences is divided by 11; multiply the two former together, and cast out the 11's, which remainder ought to be equal to the remainder of the product, if the work be right. *Note.* If the sum of the 2d, 4th, &c. digits be greater than the sum of the 1st, 3d, &c. 11 must be added to the latter.

Thus,

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Thus, for example, to prove the truth of the multiplication in the following example.

$$\begin{array}{r} 741746 \text{ diff. of digits } 5 \\ 3462 \text{ diff. of digits } 8 \\ \hline 1483492 \\ 4450476 \\ 2966984 \\ 2225238 \\ \hline 2567924652 \text{ diff. } 7 \end{array}$$

This method, though not so easily expressed, is as ready in practice as the rule by 9's, and being independent of it, we may conclude, with a very considerable degree of certainty, that any example that proves right by both rules, is really so in the operation. And the same rule is applicable to any other radix, by making that radix plus 1 the divisor.

Cor. 3.—By means of *Cor. 1. Prop. 4. and Cor. 1. Prop. 5.* we are enabled to ascertain if a number be divisible by 3, 6, 9, 11, and 18, without attempting the operation, which is useful in finding the common measure of two numbers, reducing a fraction to its lowest terms, &c. And to these rules we may add the following; *viz.* if a number terminates with 5 or 0, it is divisible by 5 in both cases, and by 10 in the latter case; and if the two last digits of any number is divisible by 4, the whole number is divisible by 4; if the three last digits be divisible by 8, the number is divisible by 8; and generally, if the n last digits be divisible by 2^n , the whole number is divisible by 2^n .

For every number ending in 5 or 0, is of one of the forms $10N + 5$, or $10N + 0$, both of which forms are evidently divisible by 5, and the latter by 10.

Again, every number may be expressed by $A \times 10^n + B$, where B represents the n last digits: thus, for example, $7846144 = 784614 \times 10 + 4 = 78461 \times 10^2 + 44 = 7846 \times 10^3 + 144$, &c. And since 10 is divisible by 2, 10^n is divisible by 2^n ; therefore, in the form $A \times 10^n + B$, which may represent any number whatever, 10^n is divisible by 2^n , and B by 2^n by hypothesis, therefore $A \times 10^n + B$ is divisible by 2^n , if B be so; that is, if the n last digits be divisible by 2^n .

PROP. VI.

To perform duodecimal operations by means of the duodecimal scale of notation.

Rule.—Transform the number of feet, if above 12, into the duodecimal scale, and set the inches and parts as decimals. Then multiply as in common arithmetic, except carrying for every 12 instead of for every 10, as in the common operations, and in the result transform again the integral part of the product into the denary scale.

Exam. 1.—Multiply 17 ft. 3 in. 4' by 19 ft. 5 in. 11'

$$\begin{array}{r} 17 \ 3 \ 4 = 15'34 \\ 19 \ 5 \ 11 = 17'5\pi \\ \hline 13208 \\ 7248 \\ 00\pi4 \\ \hline 1534 \\ \hline 336 \text{ ft. } 9 \text{ in. } 6' \ 8'' \ 8''' \ 2409688 \text{ answer.} \end{array}$$

Proof by 11.

$$\begin{array}{c} \diagup 4 \diagdown \\ 2 \times 4 \times 2 \\ \diagdown 4 \diagup \end{array}$$

Exam. 2.—Find the solidity of a cube, whose side is 13 ft. 7 in. 7'.

$$\begin{array}{r} 11'77 = 13 \ 7 \ 7 \\ 11'77 \\ \hline \end{array}$$

Proof.

$$\begin{array}{c} \diagup 3 \diagdown \\ 5 \times 3 \times 5 \\ \diagdown 3 \diagup \end{array}$$

$$\begin{array}{r} 7\pi51 \\ 7\pi51 \\ 1177 \\ 1177 \\ \hline \end{array}$$

$$\begin{array}{r} 135'9\pi61 \\ 11'77 \\ \hline \end{array}$$

$$\begin{array}{r} 9049867 \\ 9049867 \\ 1359\pi61 \\ 1359\pi61 \\ \hline \end{array}$$

$$\begin{array}{c} \diagup 4 \diagdown \\ 3 \times 4 \times 5 \\ \diagdown 4 \diagup \end{array}$$

$$1571'281417 = 2533 \text{ ft. } 2 \text{ in. } 8' \ 1'' \ 4''' \ 1'' \ 7'' \text{ anf.}$$

This method was first published by the writer of this article, in *Nicholson's Journal*, vol. xxv. and it appears to possess considerable advantage over the common rule, both on account of the facility of operation, and the accuracy of the result, as likewise that it may thus be submitted to proof, the same as common multiplication, which it is not possible to apply to the old method. In the above examples, the proof of 11 is only made use of; but it is obvious that it might also be proved by 13, according to the rule in *Prop. 5.*

And in the same manner, any other arithmetical operation, such as division, extracting the square root, &c. is performed with as much facility as in common numbers.

Exam. 3.—Given the area of a rectangle equal to 174 feet 11 inches, and its length 15 feet 7 inches; to find its breadth in feet, inches, &c.

$$174 \text{ ft. } 11 \text{ in.} = 126'7, \text{ and } 15 \text{ ft. } 7 \text{ in.} = 13'7$$

$$137)126'7(7'2841$$

$$\begin{array}{r} 1235 \\ \hline \end{array}$$

$$360$$

$$272$$

$$020$$

$$248$$

$$540$$

$$524$$

$$180$$

$$137$$

$$45$$

The breadth is, therefore, 11 ft. 2 in. 8' 4'' 5'''.

As the above method of proving division is seldom or never given in books of arithmetic, it may not be amiss to say how it is effected, which is this; from the sum of the digits in the dividend, take those in the remainder; then the remainder from the divisor and quotient ought to be equal to that of the dividend thus reduced, if the work be right. The reason for which is evident, because the dividend minus the remainder may be considered as the product arising from the multiplication of the dividend and quotient.

X 2

Exam.

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Exam.—Given the breadth and area of a rectangle, equal to 24 feet 9 inches, and 971 feet 10 inches, to find its length.

$$24 \text{ ft. } 9 \text{ in.} = 20 \cdot 9, \text{ and } 971 \text{ ft. } 10 \text{ in.} = 68 \cdot 7 \cdot 9.$$

$$20 \cdot 9) 68 \cdot 7 \cdot 9 (33 \cdot 323$$

623

687

623

670

623

490

416

760

623

139

Proof by 11.



Therefore its length is 39 ft. 3 in. 2' 3'''.

And the same principles are equally applicable to the extraction of the square root, as is evident by the following example.

Exam.—Having given the area of a square equal to 17 ft. 4 in. 6', required the length of its side.

$$15 \cdot 46 (4 \cdot 2027$$

14

82

146

2

144

8402

20000

2

14804

8404

737800

674404

47378

Proof.



Therefore the side is 4 ft. 2 in. 0' 2' 10'''.

And thus may any other numerical operation be performed with as much facility as in common arithmetic.

Let us now shew the application of the preceding principles to two or three curious problems proposed by Euler, in his "Analysis Infinitorum."

PROP. VII.

Every number less than 2^{n+1} is compounded of some number of terms in the series

$$1, 2, 2^2, 2^3, 2^4, 2^5, \&c. 2^n.$$

This is made evident by transforming the given number $N < 2^{n+1}$ into the binary scale, which, from what has been observed at Cor. 2. Prop. 1, will assume the form

$$N = a \cdot 2^n + b \cdot 2^{n-1} + c \cdot 2^{n-2} \dots p \cdot 2^2 + q \cdot 2 + w,$$

where $a, b, c, \&c.$ are each less than 2, and consequently either 0 or 1; and as every number less than 2^{n+1} may be thrown into this form; therefore, with the above series, every number whatever within the assigned limits may be compounded of some number of those terms.

Cor. 1.—What is said in the above demonstration not only proves the truth of the theorem, but also points out the

méthod by which it is to be effected; and at the same time it is evident, that there is only one way in which the selection can be made.

Cor. 2.—In the above theorem the greatest power of 2 is 2^n ; and, consequently, the greatest number that can be formed is $2^{n+1} - 1$; but if the power of 2 be unlimited, so also will the number that may be compounded of those terms; that is, any number whatever may be compounded of the terms of the indefinite series 1, 2, 2^2 , 2^3 , 2^4 , &c.

Exam.—Having a series of weights of 1lb. 2lb. 4lb. 8lb. 16lb. &c., it is required to ascertain which of them must be selected to weigh 1719 lb.

First, 1719, in the binary scale, is represented by 11010110111; the weights, therefore, to be employed, are 1 lb. + 2 lb. + 2^2 lb. + 2^4 lb. + 2^5 lb. + 2^7 lb. + 2^8 lb. + 2^{11} lb.

PROP. VIII.

Every number whatever may be formed by the sums and differences of the terms of the geometrical series 1, 3, 3^2 , 3^3 , &c.

For by transforming the given number N into the ternary scale of notation, it will assume the form

$$N = a \cdot 3^n + b \cdot 3^{n-1} + c \cdot 3^{n-2} \dots p \cdot 3^2 + q \cdot 3 + w,$$

where each of the co-efficients $a, b, c, \&c.$ are less than 3, and, consequently, they must be either 2 or 1 or 0. Now, in order to prove the truth of the theorem, it will be better to select a partial example, the reasoning on which will be evidently applicable to every other case. First, then, it is obvious, that if no one of these co-efficients be greater than 1, the question is resolved agreeably to the conditions of the proposition. We need, therefore, only consider the case, in which some one or more of the co-efficients are equal to 2. Let, then,

$$N = 3^n + 2 \cdot 3^{n-1} + 0 \cdot 3^{n-2} + 2 \cdot 3^{n-3} + 3^{n-4} + 0 \cdot 3^{n-5} + 2 \cdot 3^{n-6}, \&c.$$

$$\text{And since } 3 \cdot 3^{n-6} = 3^{n-5}, \text{ and } 3 \cdot 3^{n-3} = 3^{n-2}, 3 \cdot 3^{n-1} = 3^n$$

The above expression is the same as

$$(2 \cdot 3^n + 3^{n-2} + 3^{n-4} + 3^{n-5}) - (3^{n-1} + 3^{n-3} + 3^{n-6}) = (3^{n-1} + 3^{n-2} + 3^{n-4} + 3^{n-5}) - (3^n + 3^{n-1} + 3^{n-3} + 3^{n-6}) = N$$

agreeably to the conditions of the proposition.

Remark.—The latter part of the above demonstration is only for a particular case, but it is evident that the same reasoning will apply to any case, or even to the general form; but it would have only tended to lengthen and embarrass the demonstration, and at the same time would not have added to the certainty of the conclusion; for which reason, it was thought better to proceed as above. This demonstration, like that in the foregoing proposition, has the advantage of pointing out the method of solution, at the same time it proves the truth of the theorem, and, like that also, shews that there is only one way in which the solution can be effected.

Cor.—It appears from this theorem, that with a series of weights, 1 lb. 3 lb. 3^2 lb. 3^3 lb. 3^4 lb. &c., any number of pounds whatever may be ascertained, by placing some of those weights in one scale, and some in the other, when the case requires it, or only in one scale, when the given weight is compounded of any number of those terms. The solution of which problem is readily deduced from the foregoing demonstration.

Exam. 1.—Required in what manner the weights must be

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be selected out of the foregoing series, to weigh 716 pounds.

First, 716, in the ternary scale, is expressed by

$$\begin{array}{rcl}
 & 222112 & \\
 \text{Add} & \underline{\quad 1 \quad} & = 1 \\
 & 222120 & \\
 \text{Add} & \underline{\quad 10 \quad} & = 3 \\
 & 222200 & \\
 \text{Add} & \underline{\quad 100 \quad} & = 3^2 \\
 & 1000000 & = 3^6
 \end{array}$$

Therefore, $222112 = 3^6 - (3^2 + 3 + 1)$; that is, 3^6 must be placed in one scale, and the three weights $3^2 + 3 + 1$ in the other scale, with the body to be weighed.

Exam. 2.—What weights out of the above series must be selected to ascertain a weight of 1319 lb.

First, 1319 = 1210212 in the ternary scale

$$\begin{array}{rcl}
 & 1210212 & \\
 \text{Add} & \underline{\quad 1 \quad} & = 1 \\
 & 1210220 & \\
 \text{Add} & \underline{\quad 10 \quad} & = 3 \\
 & 1211000 & \\
 \text{Add} & \underline{100000} & = 3^5 \\
 & 2011000 & \\
 \text{Add} & \underline{1000000} & = 3^6 \\
 & 10011000 & = 3^7 + 3^4 + 3^3
 \end{array}$$

And hence we conclude, that the weights $3^7 + 3^4 + 3^3$ must be put in one scale, and the weights $3^6 + 3^5 + 3 + 1$ in the other scale, with the body whose weight is to be ascertained.

These curious numerical problems are mentioned by Euler at page 253 of his "Analysis Infinitorum," and the possibility of any weight being ascertained by such a system of weights is rigorously demonstrated; but the demonstration in the two foregoing problems is much simpler, and they have moreover the advantage of indicating the mode of solution, which is not attainable by Euler's method.

Before we conclude this article, it will not be improper to make a few general observations on the comparative advantages and disadvantages of the different scales of notation, which have been the subject of our investigation. On this head, simplicity is evidently the first consideration to be attended to, for in that alone consists the superiority of one system over another; but this ought to be estimated on two principles, *viz.* simplicity in arithmetical operations, and in arithmetical expressions. Leibnitz, by considering only the former, recommended the binary scale, which has certainly the advantage in all arithmetical operations in point of ease, but this is more than counterbalanced by the intricacy of expression, on account of the number of figures necessary for representing a number of any considerable extent; thus we have seen, Prop. 2, that 1000 in the binary scale would require 10 places of figures, and to express 1000000, we must have 20 places, which would necessarily be very embarrassing; at the same time, that all calculations would proceed very slowly, on account of the number of figures that must be made to enter therein.

The next scale that has been recommended is the senary, which certainly possesses some important advantages; first, the operation with this system would be carried on with facility; the number of places of figures for expressing a number would not be very great; beside, that those quantities, equivalent to our decimals, would be more frequently finite than they are in our system: for example, every fraction, whose denominator is not some power of one of the factors of 10, is indefinite, and those only are finite, that contain the powers of those factors; and it is exactly the same in every other scale of notation; *viz.* those fractions only are finite, that have denominators compounded of the powers of the factors of the radix of that system; therefore, in the decimal scale only fractions of the

form $\frac{a}{2^n 5^m}$ are finite, and in the senary scale the finite

fractions are of the form $\frac{a}{2^n 3^m}$; and as there are necessarily

more numbers of the form $2^n 3^m$ within any finite limit, than there are of the form $2^n 5^m$, it follows, that in a system of senary arithmetic, we should have more finite expressions for fractions than we have in the denary, and consequently, on this head, the preference must be given to the senary system; and, indeed, the only possible objection that can be made to it is, that the operations would proceed a little slower than in the decimal scale, because in large numbers a greater number of figures must be employed to express them. This leads us to the consideration of the duodenary system of arithmetic, which, while it possesses all the advantages of the senary, in point of finite fractions, it is superior even to the decimal system for simplicity of expression; and the only additional burden to the memory, is two characters for representing 10 and 11; for the multiplication table in our common arithmetic is generally carried as far as 12 times 12, although its natural limit is only 9 times 9, which is a clear proof, that the mind is capable of working with the duodenary system, without any inconvenience or embarrassment; and hence we may conclude, that the choice of the denary arithmetic did not proceed from reflection and deliberation, but was the result of some cause operating, in an unseen and unknown manner, on the inventor of this system; and it may, therefore, be considered as a fortunate circumstance, that for this unpremeditated index, that particular one should have been selected, which holds at least the second place in the scale of general utility. This circumstance, as we have before observed, is undoubtedly connected with the formation of man, which has led all nations to the division of numbers into periods of 10, and which naturally suggested the idea of making this number the radix of the system. Still, however, the peculiar method which we employ in the representation of numbers, must not be considered as arising out of this division, but as an improvement introduced a long time afterwards, as is evident from the arithmetic of the Greeks; who, notwithstanding they made use of the same division, had no idea of our present system of notation, the great and important advantage of which, is the giving to every digit a local as well as its original or natural value, by means of which we are enabled to express any number, however large, by the combination of only ten numerical symbols, whereas the Greeks, for want of this method, were under the necessity of using 36 different characters, and with which they were not for a long time able to express a number greater than 10000; this was, however, afterwards indefinitely extended by the improvements of Archimedes, Apollonius, Pappus, &c. We have given, under the article CHARACTERS, a general idea of

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of the notation of the Greeks: it will, however, be interesting to many of our readers to have a slight sketch of their arithmetical operations; we shall, therefore, before we conclude this article, enter upon the subject, and shall explain a little more at large the nature of their notation.

The characters employed by the Greeks were principally derived from their alphabet, and considering the number of them, their arithmetic was managed with considerable facility, though it must be acknowledged that it fell very short of that simplicity which is so strongly characteristic of the modern method.

Instead of } 1, 2, 3, 4, 5, 6, 7, 8, 9,
our digits }
the Greeks } α, β, γ, δ, ε, ζ, ζ, η, θ.
employed }

To represent 10, 20, 30, 40, 50, 60, 70, 80, 90,
they used ι, κ, λ, μ, ν, ξ, ο, π, ρ.

To ex- } 100, 200, 300, 400, 500, 600, 700, 800, 900,
prefs }
they } ρ, σ, τ, υ, φ, χ, ψ, ω, Ϟ.
made }
use of }

But for the thousands, 1000, 2000, &c. instead of any distinct characters, they employed for this purpose

α, β, γ, δ, ε, ζ, ζ, η, θ;

that is, they had recourse again to their characters for the simple units, with this difference only, that, in order to distinguish them from the former, they placed a small iota, or dash, below the letter.

With these characters it is evident that the Greeks could express any number under 10,000, or a myriad; thus

991	was represented by	Ϟιζα
9999	_____	ϞϞιθ
7382	_____	ζτπβ
8036	_____	ηλζ
6420	_____	ζυκ
4001	_____	δα

And so on for other numbers; whence it is evident, that neither the order nor the number of characters had any effect in fixing the value of any number intended to be expressed; for 4001 is expressed by two characters, 6420 by three, and 7382 by four. Also, the value of each of those expressions is the same, in whatever order they are placed; thus, ϞϞιθ is the same as ϞιθϞ, or as ιθϞϞ; and so on for any other possible combination; but as regularity tended, in a great measure, towards simplicity, they always wrote the characters according to their value, as in the examples above.

In order to express any number of myriads, they made use of the letter M, placing above it the character representing the number of myriads they intended to indicate.

	α	β	γ	δ
Thus	M,	M,	M,	M, &c.
represented	10,000,	20,000,	30,000,	40,000.

thus also M expressed 370,000, M = 43720000, and generally, the letter M placed beneath any number, had the same effect as our affixing four ciphers. This is the notation

employed by Eutocius in his Commentaries on Archimedes, but it is evidently not very applicable to calculations.

Diophantus and Pappus represented their myriads by the two letters M υ. placed after the number, and hence, according to them, the above numbers would be written thus: α. Mυ, β. Mυ, γ. Mυ, δ. Mυ, &c. 370,000 = λζ. Mυ, and 43720000 = δτoβ. Mυ.

Also 43728097 is expressed by δτoβ. Mυηιζ
and 9999999 by ϞϞιθ. MυϞϞιθ

This notation, in some measure, resembles that which we employ for complex numbers, such as feet and inches, or pounds and shillings.

The same authors, however, employed a still more simple notation, by dropping the Mυ, and supplying its place with a point, thus,

instead of δτoβ. Mυηιζ, they wrote δτoβ. ηιζ;
and for ϞϞιθ. MυϞϞιθ, they wrote ϞϞιθ. ϞϞιθ;

this last number, with the addition of unity, becomes 10,000² = 100,000,000, which was the greatest extent of the Greek arithmetic, and for common purposes it was quite sufficient, because their units of weight and measure, such as the talent and stade, were greater than our pound and foot. It was, therefore, only astronomers and geometers who sometimes found an inconvenience in this limitation; thus, for example, Archimedes in his "Arenarius," in order to express the number of grains of sand that might be contained in a sphere that had for its diameter the distance of the fixed stars from the earth, found it necessary to represent a number which, with our notation, would require 64 places of figures; and in order to do this, he assumed the square myriad, or 100,000,000, as a new unit, and the numbers formed with these new units he called numbers of the second order, and thus he was enabled to express any number which, in our notation, requires 16 figures: assuming, again, (100,000,000)² for a new unit, he could represent any number, that requires in our scale 24 figures, and so on; so that by means of his numbers of the 8th order, he could express the number in question, which, as we have said above, required 64 figures in our scale.

Hence, according to Archimedes, all numbers were separated into periods, or orders, of eight figures, which idea, as we are informed by Pappus, was considerably improved by Apollonius, who, instead of periods of eight places, and which were named by Archimedes octades, reduced to periods of four figures, the first of which, on the left, were units, the second period myriads, the third double myriads, or numbers of the second order, and so on indefinitely. In this manner Apollonius was able to write any number that can be expressed by our system of numeration; as for example, if he had wished to represent the circumference of a circle, whose diameter was a myriad of the 9th order, he would have written it thus:

γ.	αυιε.	θσξε.	φπθ.	ζϞλβ.	γωμς.	βχμγ.	γωλβ.
3.	1415.	9265.	3589.	7932.	3846.	2643.	3832.
				ζϞ.	βωκδ.		
				7950.	2824.		

Having thus given an idea of the Grecian notation for integer numbers, it remains to say a few words on their method of representing fractions. A small dash set on the right of a number,

NOTATION.

number, made of that number the denominator of a fraction, of which unity was the numerator : thus,

$\gamma' = \frac{1}{3}$, $\delta' = \frac{1}{4}$, $\xi\delta' = \frac{1}{64}$, $\rho\alpha' = \frac{1}{121}$ &c. but the fraction $\frac{1}{2}$ had a particular character, as C, or <, or C', or <'.

When the numerator is not unity, the denominator is placed as we set our exponents.

Thus, $\epsilon^{\xi\delta}$, represented 15^{64} , or $\frac{15}{64}$;

and $\zeta^{\rho\alpha}$, represented 7^{121} , or $\frac{7}{121}$;

also $\sigma\zeta\gamma \cdot \gamma\phi\mu\delta^{\lambda\gamma} \cdot \eta\psi\theta\varsigma = 2633544^{331776} = \frac{2633544}{331776}$;

this last fraction is found in Diophantus, book iv. question 46.

As it was only our intention, in this place, to convey to the reader a connected and general idea of the notation of the Greeks, in order the better to estimate the value of the modern, or, as it is sometimes called, the Indian arithmetic, we have not entered into an explanation of their sexagesimals, as employed by astronomers in the division of the circle, and of which our's is still a representative, as is evident from the following example.

$\circ. \nu\theta' \eta'' \iota\zeta''' \iota\gamma^{iv} \iota\beta^v \lambda\alpha^{vi} = 0^\circ 50' 8'' 17''' 13^{iv} 12^v 31^{vi}$.

All, therefore, that now remains for us to do, is, by a few examples, to throw some light upon the method that was employed in order to perform the common rules of arithmetic with this complicated system of notation, referring the curious reader, who wishes for more particular information, to an ingenious essay on this head by Delambre, subjoined to the French translation of the works of Archimedes, to which essay we are indebted for the foregoing and following extracts

Example in Addition—From Eutocius, theorem 4 of the measure of the circle.

$\omega\mu\zeta \cdot \gamma\delta\kappa\alpha$	847 3921
$\xi \cdot \nu\upsilon$	60 8400
$\delta\eta \cdot \epsilon\tau\kappa\alpha$	908 2321

In this example the method of proceeding is so obvious, that it needs no explanation, being performed exactly as we do our compound addition of feet and inches; or pounds, shillings, and pence; but it is more simple, on account of the constant ratio of 10 between any character and the succeeding one.

Example in Subtraction.—Eutocius, theorem 3 on the measure of the circle.

$\theta \cdot \gamma\chi\lambda\varsigma$	9 3636
$\beta \cdot \gamma\nu \theta$	2 3409
$\zeta \sigma\alpha\zeta$	7 0227

This example also is so simple, that the reader will find no difficulty in following the operation, by proceeding from right to left, as in our subtraction, which method seems so

obviously advantageous and simple, that one can hardly conceive why the Greeks should ever proceed in the contrary way, though there are many instances which makes it evident that they did, both in addition and subtraction, work from left to right.

In multiplication, they most commonly proceeded in their operations from left to right, as we do in multiplication of algebra; and their successive products were placed without much apparent order, as is evident from the following examples. But as each of their characters retained always their own proper value, in whatever order they stood, the only inconvenience of this was, that it rendered the addition of them together a little more troublesome.

As it is burdensome to the memory, to retain in mind the value of all the Greek characters, we have, for the ease of the reader, in the following examples, made the substitutions as below, by which means their operations will be the more readily comprehended.

For $\alpha \beta \gamma \delta$, &c. we write $1^\circ 2^\circ 3^\circ 4^\circ 5^\circ 6^\circ 7^\circ 8^\circ 9^\circ$
 $\iota \kappa \lambda \mu$, &c. — $1' 2' 3' 4' 5' 6' 7' 8' 9'$
 $\rho \sigma \tau \upsilon$, &c. — $1'' 2'' 3'' 4'' 5'' 6'' 7'' 8'' 9''$
 $\varphi \beta \gamma \delta$, &c. — $1''' 2''' 3''' 4''' 5''' 6''' 7''' 8''' 9'''$

And the myriads are represented by m , placed above the number of them.

Thus, $1^\circ 2^\circ 3'$, &c. have their proper value.
 $1' 2' 3'$, &c. will represent 10, 20, 30, &c.
 $1'' 2'' 3''$, &c. — 100, 200, 300, &c.
 $1''' 2''' 3'''$, &c. — 1000, 2000, 3000, &c.
 $1^m 2^m 3^m$, &c. will be so many myriads.

After which, it will be extremely easy to follow the work in all the succeeding examples.

$\rho \upsilon \gamma$	$1'' 5' 3$
$\rho \upsilon \gamma$	$1'' 5' 3$
$\alpha \cdot \xi \tau$	$1^m 5''' 3''$
$\xi \beta \phi \rho \upsilon$	$5''' 2''' 5'' 1' 5'$
$\tau \rho \upsilon \theta$	$3'' 1' 5' 9^\circ$
$\beta \cdot \gamma \upsilon \theta$	$2^m 3''' 4'' 9^\circ$

This example may be farther illustrated thus: by beginning on the left hand, we have,

$\rho \times \rho = \alpha$, or $100 \times 100 = 10000 = 1^m$
 $\rho \times \upsilon = \xi$, or $100 \times 50 = 5000 = 5''$
 $\rho \times \gamma = \tau$, or $100 \times 3 = 300 = 3'''$

Again:

$\upsilon \times \rho = \xi$, or $50 \times 100 = 5000 = 5''$
 $\upsilon \times \upsilon = \beta\phi$, or $50 \times 500 = 2500 = 2''' 5''$
 $\upsilon \times \gamma = \rho\upsilon$, or $50 \times 3 = 150 = 1' 5'$

Also:

$\gamma \times \rho = \tau$, or $3 \times 100 = 300 = 3'''$
 $\gamma \times \upsilon = \rho\upsilon$, or $3 \times 50 = 150 = 1' 5'$
 $\gamma \times \gamma = \theta$, or $3 \times 3 = 9^\circ$

Whence by addition we have evidently $2^m 3''' 4'' 9^\circ$

The above example is exactly copied from Eutocius, and is sufficient to indicate the method that the Greeks employed in their multiplication; but it will not be amiss to present

présent the reader with another example, drawn from the same source.

$\phi \circ \alpha$	$5'' 7' 1^{\circ}$
$\phi \circ \alpha$	$5'' 7' 1^{\circ}$
$\kappa \varepsilon \gamma \xi \phi$	$25^m 3^m 5''' 5''$
M M	
$\gamma \xi \delta \rho \circ$	$3^m 5''' 4''' 9'' 7'$
M	
$\phi \circ \alpha$	$5'' 7' 1^{\circ}$
$\lambda \beta \gamma \mu \alpha$	$32^m 6''' 4' 1^{\circ}$
M	

The division of the Greeks was still more intricate than their multiplication: for which reason, it seems they generally preferred the sexagesimal division; and no example is left at length, by any of those writers, except in the latter form. But these are sufficient to throw some light on the process they followed, in the division of common numbers; and Delambre has accordingly supposed the following example.

Example in Division.

$\tau \lambda \beta \cdot \gamma \tau \kappa \theta$	$(\alpha \omega \kappa \gamma)$
$\rho \pi \beta \cdot \gamma$	
$\rho \nu \cdot$	$\alpha \omega \kappa \gamma$
$\rho \mu \varepsilon \cdot \eta \nu$	
$\delta \cdot \alpha \rho \times \theta$	
$\gamma \cdot \xi \nu \xi$	
$\xi \nu \xi \theta$	
$\xi \nu \xi \theta$	
$332^m 3''' 3'' 2' 9^{\circ}$	$(1''' 8'' 2' 3^{\circ})$
182 3	$1''' 8'' 2' 3^{\circ}$
150 0 3 2 9	
145 8 4	
4 1 9 2 9	
3 6 4 6	
5 4 6 9	
5 4 6 9	

This example will be found, on a slight inspection, to resemble our compound division, or that sort of division that we must necessarily employ, if we were to divide feet, inches, and parts, by similar denominations; which, together with the number of different characters that they made use of, must have rendered this rule extremely laborious: and that for the extraction of the square root was of course equally difficult, the principle of which was the same as our's, except in the difference of the notation; though it appears that they frequently, instead of making use of the rule, found the root by successive trials, and then squared it, in order to prove the truth of their assumption.

From the foregoing sketch of the notation and arithmetic of the Greeks, the reader will be able to form some estimate of the value and importance of the present system, which

does perhaps more honour to its inventor than any other discovery in the whole circle of the sciences, being that to which we must consider ourselves indebted for the many brilliant advances that have been subsequently made in the modern analysis and astronomy. Let any one compare the complicated multiplications of the ancients with the logarithmic operations of the moderns, and he will soon be convinced, that he cannot set too high a value upon the discovery of our present system of arithmetic, which laid the foundation of that of logarithms, and many other of the most important improvements that have been made for facilitating calculation, and thereby extending the bounds of science to their utmost possible limits. He will also perceive how slow and progressive are the steps to knowledge, and by what imperceptible degrees we arrive towards perfection. From the first rude efforts of the Greeks, when their notation carried them no farther than to write down 10,000, or a myriad, he will be able to trace them through their several successive improvements, until it became indefinite, like our own: first, by placing the character M under the number of myriads that they wished to represent, they extended it to 10,000², or 100,000,000; but this position of the character being found inconvenient, was changed for Mu, following the number it was before placed under; and this, again, was afterwards dropped for the more eligible form of a point, separating the myriads from the simple units. Afterwards, Archimedes invented his octades, or periods of eights, and thus gave an indefinite extent to the Grecian arithmetic; an idea that was considerably improved by Apollonius, by making the periods to consist of only four places, instead of eight, and dividing all numbers into orders of myriads; in doing which, it is most extraordinary that he did not perceive the advantage of making the periods consist of a less number of characters: for having by this means given a local value to his periods of four, it was only necessary to have done the same for the single digits, in order to have arrived at the system in present use: and this oversight is the more singular, as the cypher was not unknown to the Greeks, being always employed by them in their sexagesimal operations, where it was necessary; and, consequently, the step between this improved state of their notation and that of the present system was extremely small, although the advantages of the latter, compared with the former, were incalculably great. Barlow's Theory of Numbers.

NOTATION, in *Algebra*, is the representing of quantities by letters of the alphabet; or calling them by those names. See QUANTITY, CHARACTER, &c.

NOTATION, in *Musical*. See NOTES.

NOTCH, *The*, in *Geography*, a pass on the western part of the White mountains, in New Hampshire, America.

NOTCH, *Cape*, the west point of Goodluck bay, in the straits of Magellan. S. lat. 53° 33'. W. long. 74° 34'.

NOTCHENGONG, a town of Hindoostan, in the country of Berar; 47 miles S.S.W. of Nagpour; 75 miles S.W. of Ellichpour. N. lat. 20° 32'. E. long. 79° 17'.

NOTE, *NOTA*, is used for a character, or abbreviation, serving to denote or express something in a little compass.

The ancient notaries wrote all in notes, or short-hand; whence they were sometimes denominated *cursores*, *quia notis cursim verba expediebant*.

NOTES, signs or characters used to express the tone and time of each found in writing music. For the twenty-four letters of the Greek alphabet, used for musical characters, or symbols of sound, see GREEK *Musical*.

Dr. Pepusch asserts roundly, and without the least modification of doubt, or even condescending to allege a single reason

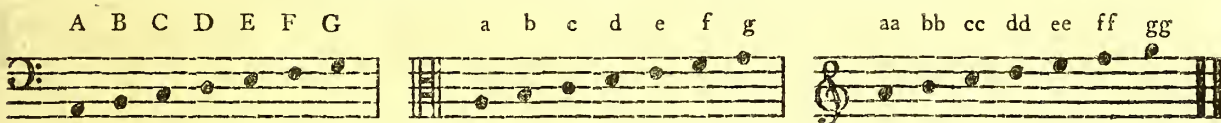
reason or proof in defence of his opinion, that "it was usual among the Greeks to consider a *defending* as well as an *ascending* scale; the former proceeding from acute to grave, precisely by the same intervals as the latter did from grave to acute. The first found of each was the *Proflambanomenos*. Phil. Trans. Martin's Abridgment, vol. x. part i. p. 261.

No instances of these inverted scales are to be found, however, in Aristoxenus, Euclid, or any of the oldest and best writers. Boethius, Bryennius, and some other of the more modern compilers, have indeed puzzled the cause by ambiguous expressions, which seem to bear such construction. This perplexity concerning the scale, if not cleared up, would injure the few fragments left of Greek music, by a mistake in this particular, as much as a poem by reading it backwards.

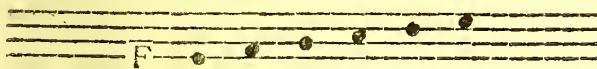
With respect to the first forms of modern notation, which succeeded points, it is not difficult to deduce them wholly from the black square note, called a *breve*, the first and almost only note used in canto fermo; which, with a foot or tail to it; is a *long*, and if doubled in breadth, a *large*. The square note also placed on one of its angles, differs very little from the rhombus or lozenge, and with a tail placed at its lowest an-

gle, when *open*, becomes a *minim*, and, when *full*, a *crotchet*.

Roussseau says, and others have said before him, that the Latins had eased themselves of all these difficulties of notation, and that Boethius established the use of fifteen letters only, for notation; but he does not tell us where, in what book or chapter, of his treatise *De Musica*, this reform is to be found. Boethius was only a compiler and translator from the Greek, and never seems to propose a new system or new doctrines. But it is more true, and better ascertained, that pope Gregory, in arranging and regulating the ecclesiastical chants, finding that the intervals of the second octave of the scale were, in effect, the same as the first, and that the order was the same in the upper and lower octave of the system; reduced the notes to the *septem discriminata vocum*, as the ancient Romans had done in the time of Horace and Virgil; and these notes, expressed by the first seven letters of the alphabet, were repeated in a different sized literal character, from octave to octave, the gravest of which he expressed by capitals, the mean by minuscules, and the highest by double letters, thus: which in modern notes would constitute the following scale.



And these letters are still retained in most parts of Europe, as *denominations* of musical sounds, though a different entablature and notation is used in practice. At length Guido, a Benedictine monk of Arezzo, in Tuscany, substituted to these letters points, placed on different parallel lines, to each of which a letter served as a clef or key. These points were afterwards enlarged, and placed in the spaces between the lines; and, at length, these lines and spaces were multiplied as occasion required. (See *STAFF* and *GAMMUT*.) Menage, in his "*Origine de la Langue Françoise*," gives the following derivation of the word *gammut*. "Guido Aretinus, a Benedictine monk, who had been employed to correct the ecclesiastical chants, about the year 1024, composed a scale, conformable to the Greek system, adding to it a few sounds above and below. And discovering afterwards that the first syllable of each hemistich in the hymn to St. John the Baptist, written by Paul Diaconus, who lived about the year 774, formed a regular series of six sounds ascending,



Ut, re, mi, fa, sol, la.

he placed at the side of each of these syllables one of the first seven letters of the alphabet, A, B, C, D, E, F, G, and because he accompanied the note which he added below the ancient system with the letter *gamma*, the whole scale was called *gammut*, a name by which it is distinguished to this day."

For a long time the points, letters, and syllables which served as notes, were of no other use than to mark the degrees of gravity and acuteness, and fix the intonation. As to duration, they were all equal, with no other difference, than that of long and short syllables, used in chanting. Canto fermo still remains nearly in the same state to this day in the Roman Catholic churches. And the music of the metrical psalms, with the Protestants, is still more imperfect; since in the performance of them no distinction is made even in long and short syllables, or of semibreves and minims, though their figure has been preserved.

This want of distinction in the time of notes and their value, as to duration, is generally supposed to have continued till about the year 1338, when John de Muris is said to have invented figures to express different durations of sound, and to have formed a time-table. His claim to this invention is considered in his biographical article. (See also *CHARACTERS* and *TIME-TABLE*.) In the first tables that were found, the notes were all black; then full and void, mixed; and lastly, all white, as far as the minim. The complete time-table does not seem finished till the end of the 16th century. Morley's characters in his table begin with the *maxima*, or large, and go no farther than the semiquaver. The modes or characters placed at the beginning of a movement, to mark the time and relative proportion of notes, are likewise ascribed to John de Muris. All the notes now in use in secular music, are contained in the following table.

NOT

NOT

One Semibreve — — — — —

is as long as 2 Minims — — — — —

4 Crotchets — — — — —

8 Quavers — — — — —

16 Semiquavers — — — — —

32 Demi-semiquavers — — — — —

Rests, or characters for silence.

COMMON TIME, or DUAL MEASURE.

Alla breve.

TRIPLE TIME.

NOTE, *Sensible*, Fr. is the half note below the key-note, and a sharp third above the fifth, or dominant. There is no term in the French musical technica so expressive as this; it describes the sensations of every discriminative ear, and the eagerness which it excites to move to the key-note, particularly if the fifth is accompanied with the seventh. Almost every accidental sharp in the course of modulation is a *note sensible*, leading to a new key. B is the note sensible of the key of C, and G that of A.

NOTE is also used for a mark made in a book or writing, where there occurs something remarkable, and worthy of particular notice.

NOTE is also used for an observation, or explication of some passage in an author, added in the margin, at the bottom of the page, or elsewhere, by an editor.

In this sense, note stands contradistinguished to text.

The notes make the principal difference in the editions of classic, &c. authors. We have Virgil, Horace, Terence, &c. with Ruzus's notes, the Dauphin's notes, Dacier's notes, Bentley's notes, Hare's notes, with *notis variorum*, &c.

NOTE is also a minute, or short writing containing some article of business.

In which sense we say, a *promissory note*, a *note under hand*, a *bank note*, &c.

Bank notes are made payable to bearer on demand; in which respect they differ from post-bills, which are payable to order at seven days sight.

By 3 & 4 Ann. cap. 9; all notes signed by any persons, and whereby such persons shall promise to pay to any other person, or order, &c. any sum of money, the money mentioned in such note shall be due, and payable to the person to whom made, and the note shall be assignable over as inland bills of exchange; whereupon the person to whom such note is payable, or assigned, may maintain an action for the same against the person who signed, or any who indorsed the note, as in the cases of inland bills, and recover damages and costs of suit, &c. If the party, on whom any inland bill of exchange shall be drawn, refuses to accept it by underwriting it under his hand, the person to whom payable is to cause such bill to be protested, as foreign bills; but no acceptance shall charge any person, unless bills be underwritten or indorsed; and if it be not underwritten or indorsed, no drawer shall be obliged to pay costs, damages, or interest thereon, unless protest be made for non-acceptance, and within fourteen days after the same be sent, or notice thereof given to the party from whom the bill is received, or left in writing at his usual place of residence. The bill being accepted, and not paid within three days after due, protest must be made, in writing, under a copy

of the bill, by some notary public; or, if no such notary be resident in the place, then by any other substantial inhabitant, in the presence of two credible witnesses, and notice given as aforesaid, to charge the drawer, &c. Though no protest shall be necessary, except the value shall be expressed to be received in such bill, and the bill be drawn for 20*l.* at least. There is a proviso in the act, that nothing therein shall discharge any remedy any person may have against the drawer, acceptor, or indorser of any bill.

What has been said of bills of exchange is applicable also to promissory notes, that are indorsed over and negotiated from one hand to another; only that, in this case, as there is no drawer, there can be no protest for non-acceptance; or rather, the law considers a promissory note in the light of a bill drawn by a man upon himself, and accepted at the time of drawing: and, in case of non-payment by the drawer, the several indorsers of a promissory note have the same remedy, as upon bills of exchange, against the prior indorsers. See *BILL of Exchange*.

Stealing of notes, bills of exchange, &c. is felony, in the same degree as if the offender had robbed the owner of so much money, &c.; and the forging notes for money, bills of exchange, indorsements, &c. is felony, by stat. 2 Geo. II. cap. 25. See *FELONY*.

To *NOTE a Bill*, is when a public notary goes as a witness, or takes notice, that a merchant will not accept or pay it. See *PROTEST*.

NOTE of a Fine, is a brief of a fine made by the chirographer, before it be ingrossed. Or, it is an abstract of the writ of covenant and the concord; naming the parties, the parcels of land, and the agreement. This must be enrolled of record in the proper office, by 5 Hen. IV. cap. 14.

*NOTEBA*CH, in *Geography*, a town of Sweden, in the province of Smaland; 43 miles N.W. of Calmar.

NOTELÆA, in *Botany*, so named by the late M. Ventenat, from *νότος*, the south, and *ελαια*, an olive, or olive tree, alluding to the affinity of the shrubs which compose this genus, and which are natives of the southern hemisphere, to the Olive of the ancient world. Indeed this affinity is so close, that we much doubt whether they ought to be separated. Even Mr. Brown, so acute in discerning, and so prone, in many cases, to establish generic differences, though he has adopted *Notelæa*, seems inclined to think it might be united with *Chionanthus* and *Olea*, as well as *Phillyrea*; which last he has, like Mr. Salisbury, positively reduced to *Olea*. Venten. Choix de Plantes, 25. Brown. Prod. Nov. Holl. v. 1. 523. Ait. Hort. Kew. ed. 2. v. 1. 22. (Rhysofermum; Gærtn. fil. t. 224.)—Class and order, *Diandria Monogynia*. Nat. Ord. *Sepiaria*, Linn. *Jasminea*, Juss. *Oleina*, Br.

Gen. Ch. *Cal.* Perianth of one leaf, inferior, small, tubular, four-cleft, permanent. *Cor.* of four ovate concave petals, combined in pairs by their base through the medium of the stamens, longer than the calyx. *Stam.* Filaments two, opposite, awl-shaped, short, each united with the bases of the two opposite pairs of petals, alternate with each petal; anthers erect, of two cells, bursting lengthwise. *Pist.* Germen roundish, superior, of two cells; style simple, very short; stigma obtuse, simple or cloven. *Peric.* Drupa with a somewhat membranous skin. *Seed.* Nut solitary, of one cell.

Eff. Ch. Corolla of four petals, combined in pairs by the stamens. Drupa oval.

1. *N. longifolia*. Long-leaved New Holland Olive. Br. n. 1. Ait. n. 1. Venten. Choix. t. 25. (*Olea apetal*a); Andr. Repos. t. 216; but not of Vahl or Willdenow.)—

Leaves lanceolate, reticulated with veins on both sides; more or less downy, without dots, beneath. Segments of the calyx unequal. Stigma divided.—Native of Port Jackson, New South Wales, from whence it was procured for Kew garden, by Sir J. Banks, in 1790. It is kept in the greenhouse, and flowers from March to July. The stem is shrubby, with numerous, round, branches, downy when young. Leaves opposite, rigid, lanceolate, entire, often wavy, tapering at each end, various in breadth, from three to six inches long, veiny; clothed with fine soft down, for the most part, on the under side; roughish, rarely downy, above. Footstalks short and thick. Clusters axillary, solitary, simple, about an inch long when in flower, afterwards much more; sometimes crowded about the ends of the branches with fewer or smaller leaves. Petals yellowish-white. Stigma deeply divided and divaricated. Fruit about half an inch long. The true *Olea apetal*a, found by Sir J. Banks in New Zealand, is a very different plant, with smooth elliptical leaves, curved at the point, and flowers really destitute of a corolla.

2. *N. punctata*. Dotted-leaved New Holland Olive. Br. n. 2.—“Leaves lanceolate, tapering at the base; veiny above; smooth and very thickly dotted, with obsolete veins, beneath.”—Gathered by Mr. Brown in the tropical part of New Holland.

3. *N. ovata*. Ovate New Holland Olive. Br. n. 3.—“Leaves ovate, smooth, without dots. Segments of the calyx equal. Stigma sessile, undivided.”—Gathered by Mr. Brown near Port Jackson. We obtained from Kew garden, in 1798, a specimen which answers to this character, but no such species occurs in Mr. Aiton's work. Our plant has leaves three or four inches long, and above one broad, entire, acute at each end, coriaceous, smooth, the transverse veins most visible beneath. Clusters axillary, of but few, and rather large, white flowers, each cluster about an inch long, or equal to the footstalks. Bractæas half an inch long, ovate, concave, fringed. Stalks smooth.

4. *N. ligustrina*. Privet-leaved New Holland Olive. Br. n. 4. Ait. n. 2. Vent. Choix, under p. 25.—“Leaves lanceolate, narrow, elongated, stalked, very smooth; simple in the margin; dotted beneath; veins obsolete on both sides.”—Native of Van Diemen's land. Sent to Kew by P. G. King Esq. in 1807. It is kept in the greenhouse, flowering in July and August.

5. *N. microcarpa*. Small-fruited New Holland Olive. Br. n. 5.—“Leaves linear-lanceolate, elongated, tapering at the base, nearly sessile, very smooth; slightly dotted beneath; manifestly veiny above.”—Native of the tropical part of New Holland. Drupa less than a pea; in the preceding larger.

NOTHÆ COSTÆ, in *Anatomy*, a term under which the false ribs are sometimes described.

NOTHING, *Nihil*, *nihilum*, or *non ens*.

The schoolmen distinguish between nothing taken strictly, which is what is impossible, or implies a contradiction; and nothing taken more generally, which is both applied to what is possible and impossible.

Again, they distinguish nothing into *negative*, which is the absence of reality in any subject; and *privative*, which is the absence of reality in a subject capable thereof, or wherein it ought to be found.

NOTHOLÆNA, in *Botany*, so called by Mr. R. Brown, as we presume, from *νόθος*, spurious, and *λανος*, wool; because there is no involucre, but in its stead the bristly, scaly, or woolly covering of the frond affords a sort of spurious protection to the fructification. Brown Prodr.

Nov. Holl. v. 1. 145.—Class and order, *Cryptogamia Filices*; sect. *Annulata*. Nat. Ord. *Filices*.

Ess. Ch. Capsules in a marginal line, either continued or interrupted. Involucrum none; (except the bristles, scales, or woolliness of the frond, separating the capsules.)

This genus is formed, by the learned writer above mentioned, out of some species hitherto supposed to belong either to *Acrostichum*, *Pteris*, or Swartz's *Cheilanthes*, with which they severally agree in habit.

1. *N. Maranta*. (*Acrostichum Marantæ*; Linn. Sp. Pl. 1527. Swartz. Fil. 14. *Lonchitis aspera Maranthæ*; Camer. Epit. 666.)—Frond doubly pinnate, lanceolate; covered beneath with linear tawny scales. Branches oblong, rather close. Leaflets oblong, obtuse; the lowermost dilated, and somewhat lobed, at the base; uppermost confluent.—Native of Italy, Switzerland, and the Levant, in the clefts of rocks. This is a beautiful fern, about a foot high, with a long, brown, zigzag, rough and hairy stalk. The leafy part is from three to six inches long, and near two in breadth, smooth, and of a deep, somewhat glaucous, green, above; covered beneath with long, pointed, imbricated scales, of a rich golden brown. The tufted roots are covered with long tawny slender bristles.

2. *N. distans*. Br. n. 1.—Frond doubly pinnate, linear-lanceolate, very rough with bristly scales. Branches opposite, distant, somewhat deltoid. Leaflets oblong, obtuse; the lower ones pinnatifid. Stalk bristly throughout.—Native of Port Jackson, New South Wales. We received it from Dr. White. The frond is much more linear than in the foregoing; its primary divisions more distant. The colour of the scales is a rather pale brown, without any of the golden tawny hue, so remarkable in the first species.

3. *N. vellea*. Br. n. 2.—“Frond doubly pinnate, of a narrow triangular figure, hoary with entangled down. Branches nearly opposite. Leaflets oblong, obtuse; the lower ones cut. Stalk woolly throughout.”—Gathered by Mr. Brown in the tropical part of New Holland.

4. *N. trichomanoides*. (*Pteris trichomanoides*; Linn. Sp. Pl. 1532. Swartz. Fil. 102. *Trichomanes argenteum*, ad oras nigrum; Plum. Fil. 57. t. 75. Pet. Fil. n. 137. t. 9. f. 16. *T. majus*, pinnis sinuatis subtus niveis; Sloane Jam. v. 1. 80. t. 35. f. 1.)—Frond pinnate, linear. Leaflets numerous, somewhat ovate, obtuse; lobed at the base; powdery and often hairy beneath.—Native of Jamaica and Hispaniola. Plumier says it grows on all sorts of soil, whether dry or moist, on rocks and in woods. Numerous fronds, from six to twelve inches high, arise from the tufted root, and are of a linear figure, scarcely an inch wide, composed of very numerous, mostly alternate, stalked leaflets, one-third or one-half of an inch long, broadish-ovate, a little oblique, obtuse, with more or less of a roundish shallow lobe at their base. Their margin is fringed with a dense row of tufted, or stellate, brown hairs, within which, but close to it, runs a nearly simple line of annulated capsules. The upper side of each leaflet is smooth, or very slightly hairy; the under covered, as if white-washed, with a dense opaque white powder, occasionally leaving the dark polished midrib visible, and mostly besprinkled with a few hairs. The Linnæan specimen is remarkable for a dense hairy covering on the under side, concealing or obliterating this whiteness; yet it seems but a casual variation.

5. *N. Pumilio*. Br. n. 3.—“Frond pinnate, smooth. Leaflets from three to seven, oval, nearly entire, slightly recurved at the margin.”—Gathered by Sir Joseph Banks, in the tropical part of New Holland.

NOTHUS, *νοθος*, a Latin term, properly signifying a *bastard*, or a person of spurious birth.

Hence it is applied figuratively, by physicians, &c. to such diseases, as, though, in respect of a similitude of symptoms, &c. they have the same denomination as some others; yet are of a different origin, seat, or the like, from the same.

NOTHUS is sometimes also used for the back part of the chest, or thorax.

NOTIOMETER. See HYGROMETER.

NOTION, *Notio*, in *Logic*, an idea or representation of any thing in the mind.

This term and the word idea are often taken in the same sense; but an ingenious author observes, that we cannot strictly be said to have an idea of an active being, or of an action, although we may be said to have a notion of them. I have some knowledge, or notion, of my mind, and its acts about ideas, inasmuch as I know, or understand what is meant by those words. What I know, that I have some notion of.

However, the terms idea and notion may be used convertibly. But yet it conduces to clearness and propriety, that we distinguish things very different by different names. It is also to be remarked, that all relations including an act of the mind, we cannot so properly be said to have an idea, but rather a notion of the relations or habitudes between things; but, if in the modern way, the word idea is extended to spirits, relations, and acts, this is, after all, an affair of verbal concern.—Berkeley, Princip. of Hum. Knowl. sect. 142. p. 160, 161. See IDEA.

M. Leibnitz is very accurate in the distinction of notions, in the *Acta Erud.* Leipf. anno 1684.

NOTION, *A clear*, he defines to be such an one as suffices us to recollect the object; v. g. that a given figure is reckoned in the number of triangles.

NOTION, *An obscure*, is that which doth not suffice to recollect the object; such, v. g. is that of a plant, which upon seeing, you are in a doubt whether or no it be the same you had seen elsewhere, and which is called by this or that name.

NOTION, *Difflinæ*. See DISTINCT.

NOTION, *A confused*, is that wherein you are not able to assign the very marks or characters whereby you recollect the object, though it be resolvable into them. Such, v. g. is the notion of red colour.

NOTION, *Abundant*. See ABUNDANT.

NOTION, *An adequate*. See ADEQUATE.

NOTION, *An inadequate*, that wherein you have only a confused notion of characters that enter a distinct one.

Some confused notions are admitted into mathematics; viz. such whose resolution is of no great consequence to any demonstrations.

Thus, Euclid does not resolve the notion of equality, though it enter the notion of an equilateral triangle, a rhombus, &c. inasmuch as the propositions, for whose demonstration it should be used, are easily granted, without such a detail: as v. g. that things equal to the same third are equal to one another, &c. but no notions are admitted into the number of mathematical definitions, except distinct ones, and those too as adequate as possible, or as occasion requires.

The schoolmen distinguish notions into *formal*, and *objective*; and each of these they subdivide into *first* and *second*.

NOTION, *A first formal*, is the knowledge we have of any thing according to what it is, or has in itself; as the knowledge of fire, *quatenus* fire; of a light body, *quatenus* light, &c.

NOTION,

NOTION, *A first objective*, is the thing itself known, according to what it is, or has in itself; as the fire known as fire, &c.

NOTION, *Second formal*, is the knowledge of a thing according to what it receives from the understanding: as, of fire, that it is the subject, and not the predicate.

NOTION, *Second objective*, is what agrees to the thing by means of the operation of the intellect, or what it receives from the intellect.

NOTIONS, *Common*, called also *prenotions*, *προληψεις*, and *κοιναι εννοαι*, are certain principles supposed by some writers to be innate, and which therefore are self-evident, *i. e.* appear, or are known by their own light, without the intervention of any medium or proof; being impressed, as it were, by the finger of God, to serve as the foundations of all our conclusions in the sciences, which are to be demonstrated hereby.

These *common* notions, considered as the foundations of sciences, are called *axioms*.

They are called *common*, not as if so actually and necessarily perceived by every person, that nobody could be ignorant of, or deny them; but because they are judged to be true and certain, by all persons of sound reason.

For the same reason as we say, such a food is wholesome; not that it is so to all men, but to all that are of a sound body and constitution. *Aristot. Topic. c. 4.*

There are two kinds of *common* notions, *viz. theoretical*, which lay the ground-work for speculation; such are, every thing either is, or is not; nothing can be made by itself; the whole is greater than a part; equal things being added to equal, the sums are equal: and *practical*, which lay the foundation for honesty, and good morals; such are, God is to be beloved, and worshipped; our parents to be honoured; to give every body their due; to do as we would be done by.

Some philosophers, however, and those even of best note, deny the reality of any innate, or common notions; urging, that the mind does not need any actual notions, to prepare it to think, but that an innate faculty of thinking may suffice; as appears in an infant, from its perception of pain, taste, colour, &c. They add, that the common organs of sense, if they have but objects presented to them, and the faculty we have of reflecting on, and variously combining or ordering, the ideas received thereby, are sufficient to furnish us with all the stock of knowledge we have. See **IDEA** and **COMMON SENSE**.

NOTIONAL QUANTITY. See **QUANTITY**.

NOTITIA, **NOTICE**, something that has come under a person's knowledge or observation.

Hence *notification*, the action of giving notice, &c.

NOTITIA is also the title of certain books, composed for giving a particular knowledge of the places, roads, &c. of a province, kingdom, diocese, or the like.

Such is the *Notitia Imperii*, &c. **M. Valois** has given a *Notitia Galliarum*, being a collection of the several names which the cities and provinces of that kingdom bore at different times.

The *Notitiæ Dignitatum Imperii*, both eastern and western, are of the utmost use both in the Roman and in ecclesiastical history; yet they are of little service, at least to young people, without good notes; such are those of *Pancirollus*, &c. and unless the text, which is strangely corrupted and mutilated, be supplied.

NOTKER, or **NOTGER**, in *Biography*, surnamed the *Stammerer*, a celebrated monk of the abbey of St. Gall, who flourished in the ninth and tenth centuries, was de-

scended from a noble family, and born within a short distance of that abbey, towards the close of the reign of Lewis le Debonnaire. He received his education at the monastery of St. Gall, and took the religious habit among the Benedictines on that foundation; he became distinguished by the progress which he made in sacred and profane literature, and acquired an extraordinary fame for sanctity. During the course of several years he had the conduct of the schools dependent on the abbey, and occupied his hours of leisure in the composition of literary works, and the transcription of books of merit. He died at an advanced age, in the year 912. He was beatified by pope Julius II. There are still extant by him "A Martyrology," in Basnage's "Thesaurus Monumentorum Ecclesiasticorum et Historicorum:" some other of his productions may be seen in the "Novus Thesaurus Monumentorum" of D. Pez. Moreri.

NOTKER, or **NOTGER**, a celebrated bishop of Liege in the tenth and eleventh centuries, a native of Suabia, was said to be the son of a duke of that country, though others affirm that he was nephew of Otho I. He became a monk of the abbey of St. Gall, and was entrusted with the superintendence of the schools belonging to that religious foundation. After this he was elected provost or prior of the abbey, and frequently attended at the imperial court, where he became a favourite of Otho I., who, in 971, appointed him to the high dignity of bishop of Liege. Scarcely was he settled in his see, when he devised measures for improving the city, by surrounding it with a wall, rebuilding the cathedral and several of the other churches, and erecting various magnificent structures, so that he obtained the title of "founder of the city." He was also a great encourager of the learning and science of those times, and sustained a considerable part in the management of public affairs. He was present at the council of Mousson in the year 995, and at that of Frankfort in 1007. He died in the year 1008. To him has been attributed "A History of the Bishops of Liege," which is inserted in Chapeauville's Collection of Pieces relating to the History of the City. Moreri.

NOTO, in *Geography*, a town of Sweden, in the province of Smaland; 39 miles S.W. of Wexio.

NOTO, *Valley of*, a division of Sicily, in the S.E. part of the island.

NOTO, or *Noto Nuova*, a town of Sicily, in the above mentioned valley, built after the destruction of Noto Antico by an earthquake in the year 1693; 20 miles S.W. of Syracuse. N. lat. 36° 48'. E. long. 15°.

NOTO, a lake of Russia, in the government of Archangel, about 36 miles in length, and 8 in breadth; 36 miles S.W. of Kola.—Also, a small island in the Baltic, E. of Aland. N. lat. 59° 58'. E. long. 20° 17'.—Also, a town of Japan, in the island of Nippon; 200 miles N.W. of Jedo.

NOTONECTA, the Boat-fly, in *Entomology*, a genus of insects of the order Hemiptera: the generic character is as follows; snout inflexed; antennæ shorter than the thorax; it has four wings, folded crosswise; on the upper half it is coriaceous; the hind legs are hairy and formed for swimming.

The insects of this genus, like those of the *Nepa* (which see), live in stagnant waters, and prey on aquatic animalcula: the larvæ and pupæ are six-footed and active; the former have the rudiments of wings, the others have none. There are seventeen species, arranged in two sections, *viz. A*, the insects of which have the lip elongated, conic; and *B*, of which the insects are distinguished by a conic sheath, spinous at the sides. In the former division there are thirteen species,

species, in the latter only four, which comprize the Sigara of Fabricius.

A. *Lip elongated, conic.*

Species.

GLAUCA. Upper wings yellow-brown, the anterior margin bright brown dotted with black, the tip bifid. It is found in this country and some other parts of Europe. It is particularly described in Donovan's Insects. It is very common upon stagnant water; the head is round, and for the greatest part occupied by two brown eyes; the antennæ are very small, of a yellow colour, and inserted in the under part of the head; the elytra or sheaths are of a rusty clouded colour, large, and crossed one over the other.

FURCATA. Upper wings brown, with two testaceous spots at the base. It is very like the last, and is found in France.

MACULATA. Upper wings brown, with ferruginous specks; they are bifid at the tip; it is less than the others, and is also found in France.

AMERICANA. This is of a greyish colour, but black behind; the scutellum is of a deep black, with a yellow dot each side at the base. It is, as its name imports, an American insect.

NIVEA. Upper wings whitish, immaculate, rounded at the tip. Inhabits India, and is four times as small as the Glauca.

* **MINUTISSIMA**, or small Boat-fly. This species is characterised by its greyish colour, but the head is brown; the upper wings truncate. It is found in this country and other parts of Europe. It is, as its name signifies, an exceedingly minute insect, scarcely perceptible without the use of glasses. It is transversely striated.

MINUTA. Head yellow; thorax and upper wings green, with transverse brown lines. It is an European insect.

NOVEBORACENSIS. Yellowish; upper wings with three clouded, brown, longitudinal spots. It is found in New York.

OCTO-PUNCTATA. The head of this species is yellow; the thorax is brownish; scutellum black, with five white dots; the upper wings are brown, edged with white, and marked with four black dots. It inhabits Germany.

INDICA. This is of a glaucous hue; the upper wings are tipped with black. It inhabits India.

ATOMARIA. White; above and upper wings pale grey; under wings milky. It inhabits Russia.

LUTEA. Upper wings whitish, with a marginal black streak. It is found in Denmark; and is particularly described by Müller among the Danish insects.

MARGINATA. Upper wings black, the edge and future yellow. This is also a Danish insect.

B. *Sheath conic, spinous at the Sides.*

Species.

LINEATA. Upper wings brown, with two abbreviated yellow lines. It inhabits Cayenne, and is something larger than the next.

* **STRIATA.** Upper wings pale brown, with numerous dots and streaks of dark brown. It inhabits this country and some other parts of Europe; varies much in size; the head and legs are yellow. It frequents the water, and emits a disagreeable smell. The elytra are pale, striated with a number of undulating transverse lines. Its shape is oblong; the forehead and feet are of a golden colour.

COLEOPTRATA. The upper wings are entirely coriaceous,

brown, the outer margin yellow. It inhabits Sweden, and is very like the Striata.

MINOR. Upper wings greenish-ash; it is immaculate. It is found in France, and is the Sigara minuta of Fabricius.

The insects of this genus obtained the name of Notonectæ from the singular manner in which they swim on the back, presenting the belly part uppermost. This situation seems admirably adapted to the manner which the creature adopts in feeding, which is on the under sides of plants that grow on the surface of the water; for the animal, by having its mouth thus turned upwards, is capable of taking its food with great convenience; its motions are very nimble, diving down at the instant of alarm, and rising again to the surface when the danger is past; the two hind legs serving for paddles.

NOTOPEDA, in Zoology. See ELATER.

NOTORIA, Ars. See ART.

NOTORIOUS, something known, manifest, and public.

NOTOXUS, in Entomology, a genus of insects of the order Coleoptera, of which the generic character is as follows: antennæ filiform; feelers four, hatchet-shaped; the jaw is one-toothed; the thorax is a little narrowed behind. Of this genus there are thirteen

Species.

PORCATUS. This species is black, and the shells have raised longitudinal lines. It is found in Van Diemen's land. The head is black; the antennæ are piceous; thorax cylindrical, pubescent; the shells are flat and obtuse; the legs are piceous.

VIOLACEUS. This is pubescent, black, with a violet gloss: the shells are smooth, with three yellow dots. It inhabits New Zealand.

BIFASCIATUS. Thorax rounded; body ferruginous; head black; shells with a black dot, band, and tip. This is a small cylindrical-shaped insect, and inhabits Lapland.

DUBIUS. Thorax brown; shell ferruginous, with a black line at the base, band in the middle, and dot at the tip. Found in many parts of Germany.

* **MOLLIS.** Downy; shells black, with three pale bands. It inhabits many parts of Europe, as well as our own country.

INDICUS. Head and thorax dusky; shells pale, striate, punctured. It inhabits India.

CHINENSIS. Downy, brown; shells punctured, pale, with unequal black bands. It inhabits China, and is described particularly by Fabricius.

MONOCEROS. Thorax projecting like a horn over the head; shells pale, with a black band and dot. This is an English insect, is described by Mr. Donovan as the Meloe monoceros, and is found on umbelliferous plants.

CORNUTUS. Thorax projecting like a horn over the head; shells with three black bands. It inhabits Italy.

BIPUNCTATUS. Thorax ferruginous; shell testaceous, with a black dot. It is small, and an inhabitant of Germany.

* **ANTHERINUS.** Black; shells with two ferruginous bands. It inhabits this and other countries in Europe; is found on flowers, and is very nimble in its motions.

* **FLORALIS.** Black; thorax ferruginous. Like the last, it inhabits European countries, and is about the size of the last.

MINUTUS. Black, polished; antennæ and legs palish. It is an European insect, and is also small.

NOTRE DAME, *our Lady*, a term frequently used for the Holy Virgin. Hence, feasts of Notre Dame; the office of

of Notre Dame; congregations, nunneries, and orders of Notre Dame.

NOTRE Dame Bay, in *Geography*, a bay on the E. coast of Newfoundland. N. lat. $49^{\circ} 55'$. W. long. $55^{\circ} 40'$.

NOTRE Dame de Neves, a town of Brasil, in the jurisdiction of Fernambuco.

NOT'S ISLAND, a small island near the coast of Virginia. N. lat. $38^{\circ} 38'$. W. long. $76^{\circ} 5'$.

NOTT, in *Agriculture*, a provincial term applied to hornless sheep and cattle. It is often written *knot* and *natt*.

NOTTAWAY, in *Geography*, a county of Virginia, in America, bounded N. and N.W. by Amelia, from which it was taken in the year 1788; containing 3418 white, and 5983 black people.

NOTTALEN, a town of Germany, in the bishopric of Munster; 7 miles W. of Munster.

NOTTINGHAM, a borough and market-town, and a county of itself, is situated on the river Leen, near its confluence with the Trent, in the county of Nottingham, England. It is distant 124 miles N.N.W. from London, and contains three parishes, St. Mary's, St. Nicholas's, and St. Peter's, besides an extra-parochial district attached to the castle. This place, according to the parliamentary returns of 1811, comprises 6842 houses, and a population of 34,253 persons, of whom 6815 families are engaged in trade and manufactures. In 1801 the inhabitants were only estimated at 28,861 in number.

The origin of Nottingham is not less involved in obscurity than that of any other town in Great Britain, and few have been the subjects of more speculation on this point among historians and antiquaries. John Rowe, a monk of Warwick, quoted by Thoroton, in his "History of Nottinghamshire," places its foundation 930 years before the Christian era; and some other old authors tell us that a British king, named Coilus, was interred here about the same period. Stukeley says, "one may easily guess Nottingham to have been an ancient town of the Britons;" and his conjecture is fortified with the opinion of Dr. Deering, who considers the caves in this neighbourhood, (to be afterwards noticed,) as decided evidence of a British colony. All these notions concerning the antiquity of the place, however, are merely hypothetical, or rest upon the testimony of authors of more than doubtful veracity. Nor does the idea of Gale, that Nottingham was the Roman station *Caufennis*, deserve much greater credit. In truth, no incident in its early history can be relied on as correct till the seventh or eighth century, when it seems to have been a considerable town of the Mercian monarchy. In the reign of Alfred it was of such consequence as to give name to the shire. It appears, however, to have much decreased before the Norman conquest, as *Domesday Book* assigns to it only one hundred and twenty dwelling-houses. This diminution of extent may have probably been the result of the Danish ravages, and of the state of confusion into which the whole country was thrown by the successful invasion of William. At this time, the dominion of Nottingham, and of the forest adjoining, was conferred on William Peverell, the king's bastard son, who is said to have given great encouragement to such persons as settled within the town. The court established by this superior lord, and from him called Peverell court, continued to be held till the 9th year of Edward II., when it was abolished, or at least limited in its jurisdiction. Whether Nottingham was an incorporated town previous to the Conquest, is almost equally uncertain as any other part of its early history; for though Deering says it "was doubtless a borough by prescription before that event," he does not furnish any evidence to authenticate his

assertion. The first charter, now extant, was granted in the reign of Henry II.; but as that deed merely confirms privileges enjoyed by the burgesses in the time of his grandfather, Henry I., it seems not unlikely that this prince was the person who originally constituted Nottingham a corporate town. King John confirmed the charter of his predecessor, as did likewise Henry III. and Edward I., which last empowered the burgesses to elect a mayor and two bailiffs, and granted that the mayor should be escheator within the borough. Henry VI. made the town of Nottingham a county of itself, and changed the bailiffs into sheriffs. He likewise gave power to the corporation to choose from among themselves seven aldermen, who should act as justices of the peace within the town and county of the town. In this state matters remained till the reign of James II., who deprived the burgesses of their charters; but these were restored, and some additional privileges granted, by king William, soon after his accession to the throne: and under the charter of this monarch the town is now governed. The corporation consists of a mayor, six aldermen, a recorder, two sheriffs, two chamberlains, and a common-council, composed of twenty-four burgesses, eighteen of whom are chosen by the freemen at large, but must have served the office of sheriff, and are the senior council, whilst the remaining six are chosen in the same way from the body at large, and form the junior council. These, however, have equal votes and equal rights with the others, except that the magistracy must be filled up from the senior body. Besides these officers, there are a town-clerk and a steward attached to the corporation; and an officer called a scavenger, who superintends the paving of the streets. There are likewise two pinders of the town: one of the field and another of the meadows. He that is of the fields is also woodward, and attends and answers for the town at the forest-courts. The mayor holds a particular court of pleas of land; and he and the sheriffs hold an ordinary court of record every alternate Wednesday. This town sends two members to parliament. The right of election is vested in the mayor and corporation, together with the freeholders of 40s. *per annum*, the eldest sons of freemen by birth, younger sons of freemen, if they have served seven years' apprenticeship any where, and the freemen's apprentices, as was settled by a decision of the house of commons in 1701. The number of voters has been estimated at 1700.

Nottingham has been the scene of many events of historical importance in almost every era of the English history. In the year 852, the Danes, having taken possession of this place, were besieged in it by Buthred, king of Mercia, but with so little prospect of success, that he was obliged to request the assistance of Ethelred, king of Wessex, and Alured his brother, who accordingly collected an army, and set out to join the forces of the Mercian monarch. This aid, however, did not prove so immediately effective as might have been supposed, for the Danes fought with such desperation, that the Saxons found it prudent to conclude a treaty with them, after a siege of several months, in which it was stipulated that they should immediately quit the Mercian dominions, and leave them in future unmolested. But the invaders did not long adhere to these terms; for, returning the next year, they laid waste a great part of that kingdom; in consequence of which, king Buthred retired to Rome. In 942, the Danes again took possession of this town, and held it for two years, when it was besieged and retaken by king Edmund, and remained in the possession of the Saxons till Canute, the Dane, made himself master of all England.

During the troublesome reign of king Stephen, Nottingham, having been taken by the earl of Gloucester in 1140,

was

was plundered, and nearly burnt to the ground. It was soon, however, rebuilt, and in 1153 once more met with the same misfortune, in the contests between Henry II. and his son, prince Henry, whom he had injudiciously caused to be crowned during his own life-time. From this period, the town lay in ashes till the restoration of peace, at which time great exertions were made for its re-establishment; and the king granted to the inhabitants the charter above-mentioned, as the reward of their loyalty. In the reign of Richard I., when his brother John raised the standard of rebellion against him, Nottingham changed masters several times; and a parliament was called here by Richard, in which John's estates were declared forfeited to the crown. Edward III. also held several parliaments at this town, in one of which were enacted those laws relative to the settlement of the Flemish manufacturers, that may justly be regarded as having laid the foundation of England's greatness, as a trading and commercial country. The same parliament also passed that patriotic law, forbidding all persons, except the royal family, to wear any foreign made cloths; and likewise prohibited the exportation of English wool.

A curious attempt to infringe on the liberty of election took place at Nottingham in the reign of Richard II. This monarch, having been forced by the parliament to dismiss his favourite, the marquis of Dublin, resolved to concert measures for his restoration at court, and for the assumption of arbitrary power. He accordingly proceeded to Nottingham, and commanded all the sheriffs and judges of the different counties to meet him there on important business. To these, when assembled, he communicated his design of levying an army to chastise those noblemen who had been most active in restraining his prerogatives, and demanded to know from the sheriffs what number of troops they could raise immediately. He further ordered them not to permit any representative to be chosen for the ensuing parliament, whose names were not in the list furnished by himself; but the sheriffs firmly told him it was not possible to execute his commands, for the people were in general so partial to the barons, that it would be difficult to raise an army against them; and still more so to deprive his subjects of their parliamentary rights. The judges, however, were not so scrupulous, for, when asked their concurrence to the proposed measures, they declared their acquiescence in them, and acknowledged the king to be superior to all law; but notwithstanding this subserviency of the judges, Richard found it impossible to effect his purposes at Nottingham, and therefore returned to London.

This town subsequently became remarkable for having been the place of rendezvous for the troops of Edward IV., who caused himself to be proclaimed king here shortly after his arrival in England, in the year 1461; and in 1485, Richard III. marched hence towards Bosworth field, where he was defeated and slain. In 1487, his successful rival, Henry VII., held his council of war here previous to the battle of Stoke. From this time, till 1642, nothing of importance occurs in the annals of Nottingham; but in that year it was distinguished as the place whence king Charles first formally raised his standard against the parliament. The inhabitants, however, being chiefly attached to the republican cause, his majesty was soon obliged to abandon the town, to the parliamentary forces. Many interesting and curious particulars respecting this town, its castle, and the customs of the people, during the civil wars, are detailed in "Memoirs of the Life of Colonel Hutchinson," 2 vols. 8vo. 1810.

It was at Nottingham that the meeting took place between the earl of Devonshire and a number of other noble-

men, in order to promote the glorious revolution of 1688, from which period the history of this town is little more than the history of its trade and manufactures, except that in 1795 some disturbances happened here in consequence of the overweening loyalty of one party, who chose to punish with ducking some ridiculous effusions of democratical zeal in the other. They were quelled, however, with little or no bloodshed; and Nottingham continued in quiet and prosperity till the commencement of the year 1811, when the state of our continental relations having thrown many of the manufacturers out of employment, they erroneously attributed that effect to the adoption of machinery, instead of referring it to its true source; and hence were induced to form combinations for the purpose of frame-breaking, so dangerous in their tendency, as to call for the vigorous interference of the legislature.

Nottingham, with respect to situation, has many advantages. It stands on a considerable eminence, called the Dolorous-Hill, from a tradition that king Humber made a great slaughter of the Britons here, in the reign of Albanaet. On three sides rise gentle hills, which serve to shield it from the more hurtful blasts, whilst its southern aspect is fully exposed to the enlivening rays of the sun at all seasons of the year. From this side it overlooks the fertile and extensive vale of Belvoir, the Nottinghamshire wolds, and the hills of Leicestershire; and exhibits to the traveller, as he approaches it, the novel prospect of three tiers of streets, rising regularly one above the other, and apparently embosomed in rock. Should he enter from the east, the whole mass of building is seen foreshortened; the tower of St. Mary's church and the castle then appear nearly in one group; and with the long line of the Trent and Leen bridges raise ideas of its size and importance, which its seemingly circumscribed limits would not otherwise have justified. In approaching from the north, the view is of a very opposite character. Not a building of any description can be discovered, except the church tower, till the traveller reaches the summit of a small hill above the race ground, when the town bursts instantaneously upon the view, as if by enchantment; and seems to lie in the centre of an expanded level below. The rivers Leen and Trent appear as on a map; and the fertile vale, stretching itself beyond them, forms a striking contrast to the bleak and open country through which he has passed. It looks like a new world starting into existence, and impresses upon the mind of taste and feeling sensations of peculiar delight. On the western road the character of the scenery is yet different from any of the others. Arriving at the village of Wollaton, the town is just seen; and all that is desired is then in a commanding situation. The castle and its bold cliffs rise abruptly from the verdant swells in the park; in the centre the barracks seem to form a town of themselves; and to the left are a number of windmills, which immediately excite the idea of a Dutch or of a Flemish town.

Nottingham was anciently surrounded by a massive wall and a ditch, though but few traces of either now remain. In Leland's time, however, much of the wall was standing, and several of the gates. One of the latter, indeed, still remains, and as it has been excavated from the solid rock, may continue permanent for many ages. Edward the Elder was the first who fortified this town, about the year 910; but the wall being greatly damaged during the Danish wars, it was almost entirely renewed by the Conqueror and his successors to Henry III. The extent of the town at that period is uncertain, as that circumstance is not mentioned by any author before Dcering, who says that it measured two statute miles in circumference, about the commencement of the

the last century. Its boundaries now probably include a space of somewhat more than four miles, exclusive of many detached houses, which constitute partial suburbs. The county of the town extends about ten miles in circuit, and till the year 1802 was free from the jurisdiction of the magistrates of the shire. These limits are perambulated twice a year by a jury chosen for the purpose, who are likewise bound to walk occasionally through the streets to prevent encroachments and nuisances. In this part of their duty, however, they are not so effective as might be wished; for it is believed that there are few towns more irregularly built than Nottingham. The streets, with the exception of Castle-gate, and the High Pavement, are very narrow; and far from being kept in a proper state with respect to cleanliness, though much improvement, it must be admitted, has lately taken place in this particular. Most of the houses are built of stone or of brick, in the modern style, but a small proportion of them are of ancient erection. The whole town is divided into three parishes, and seven wards. Chapel-ward, on the western side of the town; Castle-ward, in the vicinity of the castle; Market-ward, including the market-place, and the Long Row and lanes leading to the north of it; North-ward, which embraces the north-east division of the town; Bridge-ward, between St. Mary's and the Leen, and the lanes and streets to the eastward; Middle-ward, to the east of Market-ward; and Monhall-ward, containing the Low and part of the High Pavements. Each alderman, though possessing a peculiar jurisdiction over his own ward, is not obliged to reside in it; for, indeed, his jurisdiction as a justice of the peace properly extends over the whole town.

Nottingham contains several buildings appropriated to public purposes. The town-hall, situated on the High Pavement, is a large building, three stories high, with the town-prison on the ground floor. Behind this edifice is the county-prison, which is said to be managed under very excellent regulations. The town and county-gaol is also as commodious as circumstances will admit of. It would still, however, require much amelioration to render it complete; and the same thing may be remarked of the town-bridewell, which stands in St. John's-street, and was till lately a disgrace to the town. The workhouses are three in number, and are all laid out upon a convenient plan, and kept exceedingly clean. But the chief glory of Nottingham is its establishments for the relief of the diseased. The infirmary may vie, in point of architectural elegance, and internal arrangement, with any building in the country set apart for similar purposes. It consists of a centre, two advancing wings, and two ends; and is situated in a fine, airy scite, surrounded with pleasant walks and gardens. The first stone of this structure was laid in 1781, close to the spot on which king Charles erected his standard in 1642, whence the place is still distinguished by the name of Standard-hill. The total number of patients to whom assistance had been afforded from this institution, since its opening, up to March 1811, amounted to 33,926 persons. The lunatic asylum is likewise an elegant building, and in every respect admirably adapted to its object. It was opened for admission in February 1812. According to the present regulations, the patients form three classes; persons who can pay for their care and maintenance in proportion to their ability; persons admitted on the payment of very small sums; and paupers, for whom a certain rate must be paid by the county. Besides these institutions for the relief of the poor, there are perhaps a greater number of hospitals here than in any other town in the island; Plumptre's hospital, founded in the reign of Rich-

ard II., has been lately repaired and augmented by a descendant of the founder; and now supports thirteen poor old women, under the management of a chaplain and master. Collin's hospital, built in 1704, affords an asylum to twenty-four poor men and women, each having two comfortable apartments, and two shillings *per week*, with a ton and a half of coals *per annum*. The other hospitals are Willoughby's hospital in the Fishergate; Gregory's hospital in Houndsgate; Woolley's hospital in Beck-lane; Handley's hospital in Storey-street; Labourer's hospital on Tollhouse-hill; Warfargate hospital, &c.; the whole of which afford relief to upwards of 70 poor and infirm individuals; and independent of them are several alms-houses, and charity establishments in the town, of which last the most important are known by the appellation of the Peckham and Coventry charities.

The churches of Nottingham belonging to the establishment are four in number; St. Mary's, St. Peter's, and St. Nicholas's parish churches, and the extra-parochial chapel of St. James, lately built in consequence of the increased population of the town. St. Mary's church, standing on a bold eminence, is built in the form of a cross, and is apparently of the style prevalent in the reign of Henry VII., though some authors assert it to be of a much older date. It has lately undergone a thorough repair, and in the execution of his task the architect has displayed considerable taste and discrimination. In this church are several monuments of the earls of Clare, and of the Plumptre family. St. Peter's church is reckoned a handsome edifice, and is adorned with a lofty spire, but, upon examination, great incongruity appears in the style of its architecture, arising from the alterations and repairs it has undergone at different eras. St. Nicholas's church was erected in 1678, on the scite of one more ancient, pulled down during the civil wars, on account of its proximity to the castle, a circumstance which might have rendered it beneficial to a besieging army. This structure is of brick, ornamented with stone corners. It consists of a spacious nave, and two side aisles, both of which have been greatly enlarged within these few years. The church of St. James's, standing near that of St. Nicholas's, is built in imitation of the early pointed style. These being the only places of worship connected with the establishment in Nottingham, they are, as may be supposed, wholly inadequate to the accommodation of its numerous inhabitants. Hence dissenting and sectarian meeting-houses are frequent, and usually well attended, not merely by the inferior orders, but by the more respectable classes of the community. The Presbyterians have two meeting-houses, one on the High Pavement and the other near Castle-gate; and the general Baptists, the baptizing Calvinists, Quakers, and Wesleyan Methodists, have each one. The latter sect, however, far exceed any of the others in point of number. A few Roman Catholics have a chapel in Storey-street.

The market-place of Nottingham has been long admired. Leland says "it is the most fairest without exception of all England," and it is certainly one of the most spacious in the kingdom. At the upper end of it formerly stood the Malt cross, but that, with all the other crosses in the town, were destroyed during the great rebellion. The market days are Wednesday and Saturday; and there are three large fairs during the year. All of these are for cattle and horses, and the last also particularly for cheese. The new exchange is situated at the eastern corner of the market area. It was erected by the corporation in the early part of the last century, and is a handsome brick building, four stories high, and 123 feet in length. In front it is supported by a range of

stone pillars, forming a spacious, open façade, under which a part of the shambles are fixed.

The chief manufacture carried on in Nottingham is that of stockings, but we do not know that any correct estimate of the number of frames employed in this trade has been made lately. Deering says they exceeded 1200, in the middle of the last century. The bone-lace manufacture was likewise a source of great profit to the town, previous to the recent unhappy disturbances, and the improvements made by many of the manufacturers seemed to authorize the conclusion that we should soon have been enabled to rival the French in that, their much boasted branch of manufacture. Here are also several mills for spinning silk and cotton, as well as for twisting, some dyeing and bleach works, and a variety of breweries, malt-houses, and tanneries. The public schools in this town are fully sufficient in number for its size, and, from the recent regulations which have been made respecting them, are likely in future to answer every benevolent purpose for which they were founded. The free grammar-school was erected and endowed, in 1513, by Agnes Mellors, the widow of a wealthy bell-founder in Nottingham. This school had almost fallen into disuse, but in 1807 its importance was revived by the exertions of the corporation, and now sixty boys are taught in it, not only Greek and Latin, but English, writing, and arithmetic, *gratis*. An excellent charity-school is likewise established on the High Pavement; which is entirely supported by voluntary contribution, and maintains fifty poor children of both sexes, who are instructed in religion and in English reading. There are also several smaller schools, supported on the same liberal principles; one, in St. Mary's parish, educates thirty poor children, and another sixteen. The Protestant Dissenters support one for the poor children of their own persuasion, who are clothed, and plainly educated. A church of England Sunday school has been for some time in existence, whose receipts, in 1811, amounted to 127*l.*; and many others have been lately established by private individuals, either alone or collectively. The total number of children educated at these schools, and at private seminaries in this town, is estimated to exceed three thousand.

The public amusements of Nottingham are similar to those of most other large provincial towns: *viz.* assemblies, balls, concerts, theatrical representations, and horse races. The assemblies, balls, and concerts, are held in a large and spacious building in the Low Pavement. This edifice is still called the "Ladies' Assembly Rooms," though the reason of the distinction, (the existence of another, named "The Tradesman's Assembly,") has long since ceased to trench upon the harmony of society, by separating the middle classes from what was termed the polite circle. The theatre is a plain structure, without any external decorations, but very judiciously fitted up and arranged within. The races take place annually in July, on a course on the north side of the town. It was formerly four miles, though now only two miles round; and is said to be one of the best race tracks in England, so far at least as regards the nature of the ground. The race-stand, built by Mr. John Carr, of York, is a very elegant modern edifice, two stories high, the lower story projecting some distance beyond the upper, and having a ballustrade on the top, and a terrace, to which opens the upper room of seven windows in front. Equestrian and other itinerant exhibitions are occasionally brought forward at the riding school, which is situated at the Castle-gate.

Nottingham formerly contained several religious institutions. Leland says "there hath been three house of freres, as I remember, whereof two stood toward the weste of the

town, and not far from the castelle." The Franciscans, or Grey friars, had a house in the west part of the town, in a place called the Broad Marsh, not far from the castle. The wall which encircled the garden reached as far south as the river Leen. This house was founded by Henry III. A.D. 1250, and was granted at the dissolution to Thomas Heneage. Between Moot-hall gate and James's lane stood a house of Carmelite, or White friars. It was founded by Reginald, lord Grey de Wilton, and sir John Shirley, knt. in the year 1276. The site was granted by Henry VIII. to James Sturley. The house of the Hospitallers was situated at the northern extremity of the town, near the north road. The period of its foundation is unknown, but it was in existence as early as the reign of king John, and was valued at 5*l.* 6*s.* 8*d.* *per annum* in the time of Henry VIII. St. Leonard's hospital for lepers stood somewhere on the eastern side of the town. The inhabitants of this house had the privilege of cutting the dead wood in the forest of Nottingham. St. Sepulchre's was a brotherhood in the reign of Henry III., but the date of its foundation is not mentioned. In the church of St. Mary was a guild, or fraternity dedicated to the Holy Trinity. Their house on the High Pavement is still standing, and retains its original name. Besides this guild there were three chantries in St. Mary's church. In St. Peter's church was a guild of St. George, and a chantry dedicated to St. Mary; and in the church of St. Nicholas was a fraternity also dedicated to the blessed Virgin.

In surveying the vicinity of Nottingham, the most prominent object which demands attention is the castle. This edifice is situated on a bold rock on the western side of the town; and was built, in 1680, upon the site of a more ancient fortress, originally erected by William the Conqueror, and afterwards much enlarged and beautified by Edward IV. and Richard III. At an early period it seems to have been esteemed a very strong post; for in the reign of Edw. III. we find it taken possession of by Mortimer, earl of March, and the queen mother, as a place of secure residence against any efforts of the young monarch to bring the hated paramour to condign punishment. The king was therefore obliged to employ stratagem to effect his object of seizing Mortimer's person. He gained the governor, and entered the castle by a secret passage, which led to the state apartments, and succeeded, after some struggle, in apprehending the earl. Much dispute has prevailed among antiquaries respecting the passage here alluded to. Camden describes it as the subterraneous cavern now called Mortimer's hole; but Deering and Thoroton evidently shew that the great antiquary is erroneous in so doing; though neither of these authors were enabled to determine its proper situation. Mr. Stretton, however, a gentleman of Nottingham, has lately cleared up the point, by the actual discovery of the passage, which, with much labour and expence, he has been enabled to trace through all its windings to its termination at the site of the ancient keep, where the royal apartments are recorded to have been situated.

The old castle is thus described by Leland. "The base court is large and meetly strong, being beltes and giantes over the ditch into the second warde; the frontier of the which warde in the entering is exceeding stronge with toures and portecoleces; much part of the west side of this inner warde as the haul and other things be in ruins. The east side is strong and well toured; and so is the south side. But the most beautifullest and gallant building for lodging is on the north side, where Edward the Fourth began a right sumptuous pece of stone work, of the which he clerely finished an excellent goodlie toure of three heightes in building; and brought

brought up the other part likewise from the foundation with stone and marvelous fair compaced windows to lay yng of the first foyle for chambers." In this castle were several chapels. Tanner informs us that here was a college for secular priests and a cell dedicated to St. Mary, in the chapel of St. Mary under the rock.

The present castle is altogether different from the ancient one, having been designed only for the residence of the family of the duke of Newcastle, by whom it was erected. It is a large edifice on a rustic basement, which supports an ornamented front of the Corinthian order, with a grand, double flight of steps leading to the principal range of apartments. Over the door on the north-east front here alluded to, is an equestrian statue of the founder, sculptured from one solid block of stone. The other sides of the building are handsome, but less ornamented than this, and surrounding the whole is a noble terrace, which has long been a favourite promenade of the fashionables of Nottingham, and is certainly one of the finest to be found in the vicinity of any town, as it commands several extensive and varied views. The interior of the castle was once elegantly fitted up, and displayed much magnificence, but all the apartments having been neglected for many years, now contain nothing worthy the attention of the stranger or the tourist.

Mortimer's hole, above-mentioned, is a most extraordinary work of the labour of our ancestors; but the precise purpose for which it was formed and used is unknown. The entrance to it has been provided with no less than six gates, besides the side one on the left hand, since discovered to be the secret passage by which king Edward was admitted into the fortresses, as already noticed. The distance between the first and second gate was about 48 feet, from this to the third 42 feet, and from the third to the fourth 45 feet; 159 feet below this stood the fifth gate; and 27 feet still lower was the sixth and last gate, which opened into the rock yard, but is now filled up; so that the whole length of this, once well secured, passage was 107 yards, or 321 feet. It is seven feet high, and six feet wide, and had all the way down broad steps cut in the rock; and likewise openings in the same to admit light, and also to serve the soldiers to shoot their arrows through. In the upper part these holes have been much enlarged, and regularly constructed as port holes for cannon, which were placed here during the civil wars. There are besides in this part of the vault many excavations, about a foot in height, breadth, and depth. These are conjectured to have been made to lodge cannon balls, to prevent their rolling to the bottom.

The park surrounding the castle is but small, containing only 130 acres, and is at present in a very neglected state. It has no deer, and but very few trees; and indeed is only peculiarly deserving of notice on account of its Caves, or Papist-Holes, as they are vulgarly called, which stand west from the castle, in the face of a cliff almost close to the river Leen. Concerning these curious monuments antiquaries are much divided in opinion, some considering them as Druidical temples, others as places of safety excavated by the Britons, and not a few as works of Roman construction. The truth probably is, that nature herself has done more towards their formation than art, and that such parts of them as bear evident marks of human contrivance, were not the work of one age or people, but of different ages and different nations. Some of these caves are, no doubt, extremely ancient, while others of them have not probably existed above three or four centuries. Stukeley, who visited this place in the early part of the last century, observes, on the subject of the caves, that "what is visible at present is not of so old a date as the time of the Britons, yet I see no doubt that it is founded

upon their's. This is a ledge of perpendicular rock hewn out into a church, houses, chambers, dove-house, &c. The church is like those in the rocks at Bethlehem, and other places in the Holy Land. The altar is a natural rock, and there has been painting upon the wall; a steeple, I suppose where a bell hung, and regular pillars. The river, here winding about, makes a fortification to it, for it comes to both ends of the cliff, leaving a plain before the middle. The way to it was by gates cut out of the rock, having an oblique entrance for greater safety. Without is a plain with three niches, which I fancy their place of judicature or the like; between this and the castle is a hermitage of like workmanship." To this description it is scarcely possible to add any thing that will convey a more correct idea of the place, even as it remains at the present day, except that the outer parts have fallen down at several points, evidently from the effect of damp and frost, but the church and altar, and some few vestiges of ancient paintings, may be clearly traced. Many of the pillars are ornamented with capitals, &c. and the spandril pointed arch is very well imitated in various places; a fact which militates most forcibly against their very early antiquity. It is much to be regretted that no care is taken to preserve this venerable and curious specimen; the floor of it is broken into holes where the water lodges, and much of it is disfigured with the grossest filthiness. In summer these caves are the haunts of the very lowest of society, who there take up their nocturnal abode.

At the upper end of the castle park, adjoining to the Derby road, is an extensive range of barracks erected by government in 1792-3. The buildings are of brick, and command a view over the whole town.

Besides the caverns above-mentioned, many other caves are situated in the neighbourhood of Nottingham, and some of them even within the boundaries of the town. Of these the most remarkable cluster is at the village of Sneinton, which is supposed by several authors, and not without considerable show of probability, to have been the site of ancient Northampton, previous to the Norman conquest. It is now, however, a distinct lordship and parish of itself; and the ancient chapel dedicated to St. Stephen stands upon the summit of the excavated rock, but has nothing particular to recommend it to notice, except the very beautiful and extensive prospect which it commands over the vale of Belvoir. The village here is truly romantic, as many of the habitations are built within the rock, and have staircases that lead up to gardens on the top. To a stranger it is extremely curious to see the perpendicular face of the rock with doors and windows in tiers, and the inhabitants peeping out of their dens, like the inmates of another world; in fact, if it had not been at home, and therefore little regarded, this place would, without doubt, have been novelized and melo-dramatized, until all the fashionable world had been mad for getting under ground. Thoroton's History of Nottinghamshire, republished by John Throsby, three vols. 4to. London 1799.—Nottinghamia Vetus et Nova, or the ancient and present State of the Town of Nottingham, by Charles Deering, M.D. 4to. edit. 1751. Beauties of England and Wales, vol. xii. by Mr. Laird.

NOTTINGHAM, a post-town of America, in Rockingham county, New Hampshire; 12 miles N. of Exeter, incorporated in 1722, and containing 964 inhabitants.—Also, the most northern town of Burlington county, New Jersey, on the E. bank of Delaware river, between Berdenton and Trenton.—Also, a town in Prince George's county, Maryland, on Patuxent river; 16 miles N.E. of Piscataway.

NOTTINGHAM, *West*, a post-town in Hillsborough county,

New Hampshire, situated on the W. side of Merrimack river; incorporated in 1746, and containing 1267 inhabitants; about 45 miles N.N.W of Boston.

NOTTINGHAM, *East and West*, two townships in Chester county, Pennsylvania; the former having 889, and the latter 454 inhabitants.

NOTTINGHAM *Island*, an island in Hudson's Bay. N. lat. $63^{\circ} 30'$. W. long. $78^{\circ} 30'$.

NOTTINGHAMSHIRE, one of the central counties of England, is bounded on the west by Derbyshire; on the north by Yorkshire; on the east by Lincolnshire; and on the south by the county of Leicester. Its figure approaches to the elliptical; its transverse diameter extending from Alkley or Fenningly in the north, to Stanford-upon-Soar on the Leicestershire border, being a length of fifty miles; whilst its conjugate, or shortest diameter, from Teverhall on the Derbyshire border, to Collingham, which joins to Lincolnshire, may be estimated at twenty-six or twenty-seven miles. It is situated between fifty-two degrees fifty minutes, and fifty-three degrees thirty-four minutes, north latitude; and its circumference is computed to exceed one hundred and forty miles, and to contain a superficial area of 480,000 acres. According to the parliamentary returns of 1811, the houses in this shire amounted to 32,462, and the inhabitants to 162,900 in number; whereas in 1801 the houses were only reckoned at 26,153, and the population at 140,350 persons.

History.—Previous to the coming of the Romans, as little is known respecting this county as of any other portion of our island. At that event it formed a part of the territories of the Coritani, who are said by Camden to have possessed the counties of Nottingham, Lincoln, Leicester, Derby, Rutland, and Northampton. These made a powerful resistance against the progress of the Roman arms; but being ultimately obliged to submit, their dominions were included in the province of Maxima Caesariensis, which extended from the river Thames to the Humber. When the Saxons obtained possession of Britain, Nottinghamshire became part of the Mercian monarchy, and was doubtless during that period the scene of many conflicts between that kingdom and the other nations of the heptarchy. Nottingham, Newark, Southwell, and other towns in this county, frequently suffered from the incursions of the Danes, as the reader will find mentioned under the names of the respective places at which their depredations were committed. After the overthrow of the Saxon heptarchy, and the union of its several kingdoms under the superior sway of Alfred, Nottinghamshire was governed by the earls of Mercia, during whose domination no incident worthy of historical notice seems to have occurred within its boundaries. At the Conquest, the same changes took place here as in other counties; the lands being parcelled out among those who contributed by their talents or valour to place the crown on the brow of William. In his reign, and that of his three immediate successors, many castles were erected to secure the subjection of the country. Of these, the principal were the castles of Newark and Nottingham, at both which places several events of historical importance have taken place at different eras. King John died in the castle of Newark; and Nottingham has been rendered remarkable as the place of refuge chosen by Mortimer and queen Isabella, where they wished to secure themselves from falling into the hands of Edward. At Stoke, not far from Newark, Henry VII. engaged and defeated the earl of Lincoln, who had raised a formidable army to support the pretensions of the impostor Lambert Simnel in 1487. During the time of the civil war of Charles I. Newark was remarkable for the loyalty of its

inhabitants; and Nottingham no less so for its steady adherence to the parliament. For some particulars of the transactions of that period, see NEWARK and NOTTINGHAM.

General Aspect, Soil, and Climate.—The surface of this county, with the exception of the level along the banks of the river Trent, is uneven, and perhaps may be termed a hilly district, though none of the hills rise to any considerable elevation. The Nottinghamshire wolds constitute a range of high, open country, resembling the wolds of Yorkshire, and the downs of Wiltshire, and form a striking contrast to the close and fertile vale of Belvoir, and the well wooded tract of Sherwood forest, which occupies a great part of the western division of the county. The usual distribution of the soil is into sand or gravel, clay, lime-stone, and coal land; and the first of these is again subdivided into forest country and borders, the Trent Bank district, and the tongue of land beyond or east from that river. The Trent bank district accompanies the river through its whole course within the county, and varies in breadth from one to five miles. Here the soil is in general a mellow or vegetable mould, lying on sand or gravel, which sometimes appear on the surface. The same soil prevails also on the banks of the Soar, from its junction with the Trent up to Rempston, and is for the most part equally fit for tillage or for pasture. The sandy district, east of Trent, on the other hand, is extremely poor, and taken up with low moors, which are much flooded by rains. In the clay district there are two divisions, usually called "the north and south clays." The first of these, having a considerable mixture of sand in its composition, is more easily susceptible of agricultural labour than cold clay lands in general. In the more northern portions, it is agreeably diversified with hill and dale; whilst its bold promontories, rising abruptly from the dead level of Milson-Car, and their continuation in Lincolnshire, appear evidently to have been at some remote period the boundaries to an ocean, which must once have flowed over what is now a scene of rich cultivation. It is indeed impossible for any one to contemplate the view from Gringley-on-the-Hill without drawing this conclusion, and it seems still more evident if the hills are viewed from below, when they have all the semblance of islands rising from the bosom of the deep; for their northern aspect presents a series of abrupt cliffs, but on the other side they sink gradually into the general line of the country. The south clay district is less extensive than the north. It is, however, by far the most valuable division of the county, as it includes a great part of the vale of Belvoir, which offers a scene of cultivation not surpassed by any other in the kingdom. The wolds, skirting the vale, partake of the nature of its soil, but from their lofty and exposed situation are destitute of its fertility, though certainly well adapted for plantations. The lime-stone and coal lands are situated on the western verge of the county, and have in some places a surface of vegetable mould, but chiefly a cold blue or yellow clay. In point of climate, it may be observed, that Nottinghamshire is considered by all writers as much drier than most of the neighbouring counties; and this opinion has lately been confirmed by accurate and repeated experiments. The fact is explained by Mr. Lowe, in his agricultural survey, upon the very rational principle, that the clouds from the western ocean break on the hills of Derbyshire and Yorkshire, and discharge themselves before they reach the comparatively level district of Nottinghamshire; while those from the German ocean, being powerfully attracted by the same mountains, pass over the county too quickly to deposit much of their moisture. This general dryness, as may be supposed, is favourable to the temperature of the air; which, except in the marshy grounds

and in the wolds, is almost equally warm as the more southern counties.

Agriculture.—The kinds of grain usually cultivated in the county of Nottingham are the common ones of wheat, rye, barley, oats, beans, and pease; the rotation of crops, and the amount of their produce, differing according to the quality of the grounds upon which they are raised. The wheat commonly sown is the red Lammas, and the white chaffed or Kentish sort, which in common fields yield from two to three quarters, and in inclosures from two and a half to four quarters. A species of oats, called *skegs*, is much cultivated in this county, and supposed to be peculiar to it. These afford a crop double that of any other kind of the same grain in quantity, but not more than equal in weight. They will grow in the poorest land, where indeed nothing else can be raised, and are reckoned very sweet food for cattle of all kinds. In the Agricultural Survey, this sort of oats is called the “*Arena stipiformis*” of Linnæus, and defined scientifically as “panicked, calyxes two-flowered, awn twice as long as the seed, culm branchy, stipeform.” Their produce on bad land is seldom less than four quarters, and on good land they will yield fourteen or fifteen. Hops are cultivated to a considerable extent in the central parts of the county, about Ollerton, and indeed in most places of the “north clay,” by which distinctive appellation they are generally known among traders. Mr. Lowe informs us, that these hops are much stronger than the Kentish, “going almost as far again in use;” but those who are accustomed to the latter, object to their flavour as rank; a circumstance which of course operates against them in the market. At Scrooby, and a few spots in the northern district, weld, sometimes called the dyers’ weed, has likewise been long an object of culture. It is commonly sown with the barley and clover, at half a peck to an acre; and is pulled up from among the clover the year following, about the time when the latter is coming into bloom.

Few cattle are bred in this county, except on the banks of the Soar, where a number of cows are reared for the dairy. Sheep, however, are bred in great numbers, in almost every district. They are chiefly the old forest kind, or crosses of that breed with the Lincolnshire and new Leicestershire breeds. The old forest sheep, when without mixture, are described as a small polled race, with grey faces and legs, the fleeces of which may run from 13 to 18 to the tod of 28 pounds. The carcases, when fat, weigh from seven to nine pounds a quarter; but as the crosses have been found to be great improvements both on the wool and carcase, few farmers now rear this species of sheep unmixed.

State of Property, &c.—Tenures here, as in most other counties, are in all the variety of freehold, copyhold, and leasehold; and there is also a very considerable portion of church and collegiate lands. The freeholds are more extensive than numerous; and with respect to the copyholds, a great part of the small ones are “Borough English,” and descend to the youngest son. The immediate occupants of the soil are mostly tenants at will; and as their farms, in many instances, have continued in one family for several generations, they feel a sort of hereditary security, that prompts them to the same course of improvement as if they were secured by leases.

Generally speaking, the farms may be characterised as small, few of them exceeding 300*l.* per annum, and more being under 100*l.* than above that sum; many, indeed, especially in the clay district, being as low as 20*l.* The largest farms are on the poor forest lands, which have been lately brought into a state of cultivation. Rents are uni-

versally paid in money; reserving only some few boons, as they are provincially called, *i. e.* obligations to perform some carriage work (chiefly of coals) for the landlord. Tithes are in some places taken in kind, but are more frequently compounded for, at a much lower rate than they would be valued at by any surveyor. In the new inclosures, land has universally been given in lieu of tithes; and all the lands which are either now, or have been formerly church lands, are entirely tithe free. Estates vary in extent from 12,000*l.* a-year downwards to the smallest amount. The largest, as is usual in most counties, are left to the care of stewards; but many considerable as well as inferior yeomen occupy and farm their own properties.

Mineralogy.—In a mineralogical estimate, Nottinghamshire has nothing particularly worthy of attention. No metals of any description have hitherto been discovered within its boundaries. Coal and lime-stone, however, are tolerably abundant, as well as marl and free-stone. Both the coal and lime-stone strata lie on the western side of the county. The former occupy a line of considerable extent, but not more than a mile in breadth. The seams, however, are very prolific, and the coal being of a good quality, is consequently wrought with great advantage to the proprietors. But the same remark cannot be applied to the lime-stone, which is for the most part of an inferior kind, and only fit for the purposes of manure. At Mansfield are some excellent quarries of a yellowish free-stone, well adapted for building and paving; and there is also at this place a red kind, capable of being formed into cisterns and troughs. At Maplebeck is a blueish stone for building, which has the property of becoming white upon exposure for a short time to the action of the air. Beacon-hill, near Newark, is remarkable for a kind of blueish stone, for hearths, which takes so fine a polish, as frequently to be mistaken for marble; and at Linley is a coarse paving stone, much used in paving the streets of Nottingham. The quarries on this hill also produce vast quantities of gypsum, alabaster, or plaster, as it is commonly called by the inhabitants. The same material is likewise abundant in many other places, and in greater variety, and of a superior quality to that found in almost any other county of England. Marl is discovered throughout the whole extent of the clay district, but being no where used as a manure, except in one or two farms near the banks of the Trent, it is very little dug up. Mr. Lowe indeed says, that he is ignorant of any marl-pit opened within the county, but that at Bank-wood in the Trent Bank district.

Rivers.—The rivers which either take their rise in Nottinghamshire, or flow through it, are numerous, and a few of them are very considerable streams. The Trent, which has its source near Biddulph, in Staffordshire, enters this county in the vicinity of Thrumpton with a bold and rapid current, and crossing it in a north-easterly direction by Nottingham and Newark, where its stream sweeps decidedly to the north, reaches Clifton, and becomes the boundary between this county and that of Lincoln, for a distance of more than twenty miles. This river is navigable for large vessels as high as Gainborough, eight miles above West-Stockwich, at which village it leaves Nottinghamshire; and flat-bottomed small craft of thirty or forty tons burden may navigate its whole course through the county. The Erwash forms the boundary between the shires of Nottingham and Derby, and falls into the Trent near Barton; as does likewise the Soar, which flowing from the south divides this county from that of Leicester. The Mann and the Meaden, uniting their currents near Elkesley, after receiving several smaller streams, form the Idle, which runs in a northerly direction

direction by Retford and Mattersey to Bawtry, where it turns to the east, and traversing Mifson-Car joins the Trent in the northern angle of the county. The other rivers in Nottinghamshire are the Wollen, the Workop, the Dover, the Greet, and the Leen, but none of them possess any features sufficiently interesting to claim particular description.

Canals.—In this county are four principal canals, besides a number of collateral branches to different small towns and works. These are the Chesterfield canal, the Nottingham canal, the Idle River canal, and the Grantham canal. The Chesterfield canal derives its name from the town of Chesterfield, where it commences, and after a circuitous course within Derbyshire, enters this county near Shire-oaks, and continues by Workop through the northern limits of Sherwood-forest to Retford. It passes through the townships of Welham, Claborough, Hayton, Clayworth, Everton, and Drakelow, at which place it runs under a tunnel of two hundred and fifty yards, and thence round Gringley-on-the-Hill to Mifsterton, across Walkeringham-moor, and thence into the Trent at Stockwich. The whole line of this canal is upwards of forty miles in length. Its rise from Chesterfield to Norwood is about forty-five feet; and thence to the Trent it has a regular fall of three hundred and thirty-five feet. The Nottingham canal extends about fifteen miles through the county in a north-west direction, but not exactly in a right line. It commences in the river Trent, and proceeds to the Cromford canal, near Langley-bridge, close to the termination of the Erwash canal; and it is also connected with the Grand Trunk canal. A reservoir has been formed at Arncliffe with a self-regulating sluice, which lets off 3000 cubic feet of water in an hour. This canal was first opened for navigation in 1802; and the principal object for which it was constructed, was the export of agricultural produce, and of coals from the various mines in its vicinity. The Idle River canal is more properly a river navigation than a cut. It commences at Bawtry, and runs nearly due east for ten miles along the northern verge of the county. In one part of its course it is denominated the Bycar Dyke canal; and half a mile from its junction with the Trent is Mifsterton-sluice. The Grantham canal, so called from its commencing at that town, in Lincolnshire, after passing through Leicestershire enters this county about a mile from Hicking, and crossing the Wolds flows in a very circuitous line by Owthorpe and Cropwell-Bishop, till its junction with the Trent. The proprietors of the Grand Trunk canal, having been at considerable expence in deepening the river near the entrance of this canal, are entitled to take certain tolls on all goods passing from it to the Nottingham canal. At Cropwell-Bishop a branch leads off from the Grantham canal to the town of Bingham.

Forests.—In this county is the forest of Sherwood, which in ancient times was of considerable celebrity, particularly as the scene of the exploits of Robin Hood, &c. See SHERWOOD.

Commerce and Manufactures.—The malting business is carried on here to a great extent, especially at Nottingham, Newark, and Mansfield. A great deal of malt is sent by the Trent and by the canals into Derbyshire, Cheshire, and Lancashire. At Newark are great breweries, which rival those of Burton-upon-Trent. The stocking trade may be regarded, however, as the staple of the county. The first frame for making stockings is said to have been invented by one Lee, a native of Calverton. This business occupies a vast number of hands at Nottingham, and at the surrounding villages, and also at Southwell. Many cotton-mills, worked by water, to prepare the thread for the Manchester goods, and for stockings, have been established at Garnton, Lowdham,

Papplewick, Southwell, Newark, Fiskerton, Mansfield, and Basford. At Cuckney is a mill for combing wool, another for spinning worsted, and a third for polishing marble. At Arnold is a large woollen-mill; and at Retford is another for the same purpose, both of which are worked by steam. At Nottingham are several silk-mills, also an extensive manufacture of thread lace and British lace; though, unfortunately, this last branch of trade, as well as the stocking manufacture, has suffered much by the late commotions in this county. Mansfield is remarkable for its trade in stone; and at Sutton-in-Ashfield are considerable potteries of coarse red ware. A starch manufactory is now carried on at Upton, near Southwell; a sail-cloth manufactory has been long in a flourishing condition at Retford; and the dyeing and bleaching trade has been attempted, with considerable success, at Nottingham and at Newark. The exports of the county consist of most articles of its produce or manufacture; and its chief imports are timber, flax, hemp, iron, cotton, wool, and yarn, with, in general, all such articles as are not found or manufactured within its boundaries.

Civil and ecclesiastical Divisions and Government.—Nottinghamshire is politically divided into six hundreds, or wapentakes, which include eleven market-towns, and 160 parishes. The towns are Nottingham, Newark, Mansfield, Bingham, Workop, Tuxford, Ollerton, East-Retford, Bawtry, Blythe, and Southwell, accounts of which will be found under their respective names.

The ecclesiastical government of this county is now under the see of York; but it had formerly, even so late as the reign of Elizabeth, a bishop of its own. At present it consists of an archdeaconry, and four deaneries: Nottingham, Bingham, Newark, and Retford. Of the parishes and chapels, 182 are within the jurisdiction of the archdeacon, 28 belong to the church of Southwell, and seven are under the patronage of the dean and chapter of York.

The antiquities of Nottinghamshire are neither so numerous nor so important as in most of the central counties of England. The only British camp is that at Barton, about four miles south-west of Nottingham; but at Oxtun there are three large tumuli, one of which was opened by the late major Rooke, and found to contain an iron urn, filled with ashes and burnt bones, a large sword with a wooden scabbard, two daggers, and a great variety of glass beads. On the summit of the hills, called Robin Hood's hills, is a feat cut out of the solid rock, which is said by some to have been the work of Robin; but others regard it as of much higher antiquity. Roman remains are more frequent than British; and no doubt that people had many stations within this county, of which the principal were Verometum near Willoughby, Margidunum near Bingham, and Segelocum at Littleborough. Crocolana was situated on the verge of the county, partly within it and partly in Lincolnshire. The two first mentioned stations were situated on the Fosse-way, which, entering the county from Leicestershire, crosses the Ermin-street from London to York. This road may be easily traced for many miles along the wolds, and is literally a fosse. In the forests are many vestiges of military roads, which run invariably in a north-west direction, and have exploratory camps situated, at intervals, close to them. On Holly-hill, near Arnold, in Sherwood forest, may be seen a very large encampment, supposed to have been the central depôt of the Roman forces in this district, as, from its height, it commands a view over all the exploratory camps around. Gale conjectured that Nottingham was the Caennis of Antoninus, but without sufficient authority. Some notices of the caves in the vicinity of that town will be found under

under the article NOTTINGHAM. General View of the Agriculture of the county of Nottingham, &c. by Robert Lowe, esq. of Oxtou, 8vo. London edit. 1798. The Antiquities of Nottinghamshire, with Maps, Prospects, and Portraits, London, 1677, folio, by Dr. Thoroton.

NOTTURNO, Ital. a night-piece. About the middle of the last century, the nocturni à 4, of Martini, of Milan, were deservedly in high favour.

NOTZENDORF, in *Geography*, a town of Prussia, in Pomerelia; 7 miles E. of Marienburg.

NOÛ, a town of Hindoostan, in the subah of Delhi; 20 miles W.N.W. of Coel.

NOVA, or AD NOVAS, in *Ancient Geography*, a town of Mauritania Tingitana, upon the route from Tocolofida to Tingis, according to the Itinerary of Antonine, between Oppidum Novum and Ad Mercurii; 32 miles from the first, and 12 miles from the second.

NOVA, in *Geography*, a small island in the Atlantic, near the coast of Brasil. S. lat. $0^{\circ} 4'$. W. long. $50^{\circ} 30'$.

NOVA Zembla. See ZEMBLA.

NOUA, an island near the W. coast of East Greenland. N. lat. $60^{\circ} 45'$. W. long. 47° .

NOVAC, a town of Istria; 15 miles N.E. of Rovigno.

NOVACULA PISCIS, the *Razor-fish*, in *Ichthyology*, the name of a sea-fish caught in the Mediterranean, and some other seas, and much esteemed at the tables of the great.

It is a small fish, seldom exceeding three or four inches in length, and, in its flat shape, somewhat resembles the faber. It keeps about the shores, particularly such as are stony, and seems never to go into deep water; and is caught on the shores of Majorca, Minorca, the island of Malta, and elsewhere, and lives on small fish. Salvian. de Aquat. See CORYPHÆNA Novacula.

NOVACULAR LAPIS, in *Natural History*, the name given by De Laet to a stone which he describes from Ximenes, who has it under the American name *iztli*.

It is the stone out of which the natives of America made their weapons of war, and tools for other uses of life, before they knew the use of iron.

There are three species of this stone, the one blue, the other white, and the other black: they are all capable of a very high polish, and, when set in gold or silver, are very highly esteemed by the natives: they reflect the images of things, in the manner of all other highly polished bodies, and the two first are considerably transparent.

There are several quarries of these stones in the neighbourhood of Mexico, whence the Indians used to get them; they naturally split, in the getting out, into angular and edged figures, and these they afterwards fashioned to the purposes they wanted them for, and polished with the powder of a harder stone.

They still make knives of them, in a very expeditious and very remarkable manner. They hold the mass of stone between their feet, and, with an instrument prepared on purpose, they cut off pieces of four or five inches long, and about an inch broad, rising to a prominence on each side in the middle, and growing very thin toward the edges: it is wonderful to see with what expedition they finish this odd workmanship. The knives, when made, are sharper than any other instrument in the world; but they are very tender, easily broken, and more easily battered, and notched at the edges. They make also longer weapons of the same shape out of this stone, which they fix into wooden handles, with a sort of gum; and these serve them as swords. They are very terrible weapons for one blow, but they seldom hold together so as to bear a second. They make also the heads of their arrows with

them; and, when these were first found by our travellers, they were not supposed to be of human workmanship, but to have fallen from heaven in thunder, and were called by many authors *ceraunia*. Ximenes, Hist. Ind. Occid. lib. x. cap. 13.

NOVÆ, in *Ancient Geography*, a town of Lower Mælia, upon the route from Viminacum to Nicomedia, according to the Itin. Anton., between Dimon and Scavidava; 17 miles from the former, and 18 from the latter.—Also, a town of Upper Mælia, upon the route from Viminacum to Nicomedia, between Cuppæ and Talia; 24 miles from the former, and 32 from the latter.—Also, a town of the second Pannonia. It is placed by Antonine, in his Itinerary, along the coast of Gaul, on the route from Tauranum between Murfa and Antianæ; 24 miles from the former, and 23 from the latter.

NOVÆ, or *Ad Novas*, a town of Macedonia, upon the route from Hydrus to Aulon, between Apollonia and Claudianæ; 24 miles from the first, and 25 from the second.

NOVAIA, in *Geography*, a town of Russia, in the government of Tobolsk, on the Irtysh; 100 miles E.S.E. of Tobolsk.

NOVALE, a town of Italy, in the Trevisan, on the Musone; containing several churches, a convent, palaces, and about 1200 inhabitants; 10 miles S. of Trevigio.

NOVALE, in our ancient customs, denotes land newly ploughed, and converted into tillage; and which had not been tilled within the memory of man before.

“Quod novale semel fuit, semper erit novale quoad decimarum retentionem vel solutionem.” What was once novale, will ever remain so, as to the paying or non-paying of tythes. “Excepta decima novallium cuiusdam terræ, quam de novo excoluerunt.” Pat. 6. Edw. III.

NOVALE is sometimes also used for fallow land, *i. e.* land which has been ploughed for two years, and rests, or lies fallow, one more; or that lies fallow every other year.

NOVALESE, in *Geography*, a town of France, in the department of Mont Blanc; 6 miles W.N.W. of Chambery.—Also, a town of France, in the department of the Po, situated on the river Doria; 5 miles N. of Sufa.

NOVALLERA, a town of Italy, in the department of the Panaro, and capital of a small principality, held as a fief of the empire by the duke of Modena; 9 miles N. of Reggio.

NOVANAGUR, a town of Hindoostan, in Guzerat; 30 miles S.S.E. of Puttan Sumnaut.

NOVANTÆ, in *Ancient Geography*, one of the 22 British nations which, according to Ptolemy, occupied the territory S. of the wall of Antoninus, between the friths of Forth and Clyde, stationed near the peninsula called Novantium, now the Mull of Galloway. They possessed, according to Camden, the countries of Galloway, Carrick, Kyle, and Cunningham. Baxter supposes they were called Novantæ, from the British word “Now heat,” new inhabitant, and that they had come originally from the neighbouring coasts of Ireland. He farther observes, that their more modern name of Gallowadians also implies, that they were strangers. Their towns were Lucopibia, or Lukoikidion, signifying the same with Candida Casa in Latin, and Whithorn in Saxon, and deriving its name from a custom of the ancient Celts, of white-washing their chief buildings; and Religionum, Retigionum, or, as Camden and Baxter imagine it was written, Beregonium, being Bargeny in Carrick.

NOVARA, in *Geography*, a town of France, in the department of Marengo, and capital of a country, called “Novaresa,” in the duchy of Milan, the see of a bishop, suffragan

suffragan of Milan. It contains, besides the cathedral, 17 parish churches, and 18 convents. This town was taken in 1797 by the French; 8 miles N.E. of Vercelli.

NOVARIA, NOVARRE, in *Ancient Geography*, a town of Italy, in Gallia Transpadana, towards the north. Tacitus ranks it among the municipal cities of Gallia Transpadana; and some have given it to the Insubrians.

NOVARINI, LEWIS, in *Biography*, a learned Italian Theatin monk, who flourished in the 17th century, was a native of Verona, where he was born in the year 1594. He entered among the Theatins when he was about eighteen years of age, and was sent to pass his noviciate at Venice, and took the vows in 1614. He afterwards studied philosophy and divinity, and was ordained priest in 1621. Among other departments which he occupied, was that of counsellor of the Inquisition. He was deeply learned in the Oriental languages, and enjoyed the esteem of the princes and learned men of his time. He died at Verona in the year 1650, at the age of 56. He was author of a vast number of works, of which a long list is given in the 40th volume of father Nicéron's *Memoires*. The principal of these works are; "Comment. in quatuor Evangel. et Acta Apostol." in 4 vols. fol.; "Adagia Sanctorum Patrum," in 2 vols. fol.; "Electra Sacra, in quibus quæ ex Latino, Græco, Hebraico, et Chaldaico fonte, quæ ex antiquis Hebræorum, Persarum, Græcorum, Romanorum, aliarumque Gentium ritibus, quædam divinæ Scripturæ loca noviter explicantur et illustrantur," in 3 vols. folio. Moreri.

NOVA SCOTIA, in *Geography*. See *Nova Scotia*.

NOVIATANS, NOVATIANI, in *Ecclesiastical History*, a sect of ancient heretics, that arose towards the close of the third century, so called from Novatus, an African bishop; or from Novatianus, a priest of Rome.

They were called also Cathari, from καθαροί, *pure*, q. d. Puritans.

Novatian first separated from the communion of pope Cornelius, on pretence of his being too easy in admitting to repentance those who had fallen off in times of persecution.

Novatus coming to Rome, joined himself to the faction of Novatian; and both maintained, that there was no other admission into the church but by the repentance in baptism; grounding their opinion on that of St. Paul: "It is impossible for those once enlightened, and who have tasted the heavenly gift, if they fall away, to renew themselves by repentance."

Not that they denied but a person fallen into any sin, how grievous soever, might obtain pardon by repentance; for they themselves recommend repentance in the strongest terms; but their doctrine was, that the church had it not in its power to receive sinners into its communion; as having no way of remitting sins but by baptism; which, once received, could not be repeated.

In process of time the Novatians softened and moderated the rigour of their master's doctrine, and only refused absolution to very great sinners.

The two leaders were proscribed, and declared heretics, not for excluding penitents from communion, but for denying that the church had a power of remitting sins.

NOVATION, INNOVATION, in the *Civil Law*, denotes a change or alteration of an obligation, whereby it becomes extinguished or annihilated.

Thus, when an obligation is discharged without receiving any money, but a simple promise is accepted in its stead, this occasions a novation.

There are two notations; the one *voluntary*, the other *necessary* and constrained.

NOVATION, *Necessary*, is that made in consequence of a sentence or decree of justice.

NOVATION, *Voluntary*, is made three ways; viz. by changing the cause of the obligation, without the intervention of any other person; by changing the nature of the obligation; and by delegation, as when the debtor makes over a debt to the creditor for his satisfaction.

In all these cases there is a will to innovate. Accordingly, Justinian says, "Voluntate, non lege, novandum."

NOVAVOI, in *Geography*, a town of Samogitia; 40 miles S. of Rostenne.

NOUCONGUE, a mountain of Thibet. N. lat. 30° 54'. E. long. 94° 54'.

NOUDJER, a town of Hindoostan, in the circar of Ellore; 20 miles W. of Ellore.

NOUE, FRANCIS DE LA, in *Biography*, surnamed *Bras-de-Fer*, an eminent warrior and statesman, was born in 1531, of an eminent family in Brittany. He was brought up to the profession of arms, and became distinguished in Italy. On his return to France, he embraced the Calvinistic religion and party, of which he became a principal supporter. In 1567 he reduced Orleans, commanded the rear guard at the battle of Jarnac in 1569, and afterwards took Fontenoi, and several other places. At the capture of Fontenoi he received a wound which occasioned the loss of an arm, and he supplied its place with one of steel; with this he was soon able to manage his bridle, and hence he obtained his surname. He was in the Low Countries in 1571, and surprized Valenciennes; and returning after the massacre of St. Bartholemew, he was appointed by the king to the command of the troops sent against Rochelle. "On this occasion," says his biographer, "his attachment to his party, enforced by the just resentment he might feel for the late execrable massacre, overcame his sense of fidelity to his sovereign, and he carried into Rochelle for its defence the forces designed for its reduction." We much doubt whether this can be admitted as a justification of his conduct as a soldier and man of honour. It is however more to his credit, that he used all his interest during the siege to promote an accommodation upon honourable terms. In 1678 he followed the duke of Alençon into the Low Countries, and rendered great services to the States-General. He took Ninove, with count Egmont, who commanded it, but was himself made prisoner in 1680. The Spaniards thought this capture of so much importance, that they detained him in captivity five years, which he employed in literary pursuits. At the commencement of the wars of the League he retired to Geneva; when Senlis was besieged by the leaguers in 1589, he was with the army of Royalists which attempted to throw provisions and ammunition into the place, and when the merchants refused to deliver their goods without an advance of money, La Noue immediately mortgaged his estate for the required security. He continued to serve with glory under Henry IV., and in 1691 was killed by a musket-shot at the siege of Lamballe, as he was reconnoitering. He was sincerely regretted by both parties, and it is believed that few purer characters are to be met with in the history of those times. He openly and courageously declared against the practice of duelling, at that time exceedingly prevalent, and held it as a crime to hazard in personal quarrels that life which ought to be devoted to the public service. He was the author of "*Discours Politiques et Militaires*," composed in prison, and printed in 1587. His son was a writer and a brave soldier. He died in 1618, leaving behind him some religious poems, which were afterwards printed at Geneva. Moreri.

NOUE, STANISLAUS-LOUIS DE LA, count de Vair, was of

of the same family as the preceding, and born in 1729. He greatly distinguished himself as a gallant officer in the war of 1741, and also in that of 1756. He was slain in the action of Saxenhausen in 1760. Lewis XV. being told of his death, said that "he had lost the Loudon of France." The count wrote "New Military Constitutions," printed at Frankfurt in 1760.

NOUE, JOHN-SAUVE DE LA, a French actor and dramatic writer, was born at Meaux in the year 1701. The duke of Orleans assigned to him the direction of his theatre at St. Cloud, and Voltaire wrote some pieces purposely for him. He died in 1761. His tragedies and comedies were published at Paris in 1765.

NOVEL, NOVELLA, in *Jurisprudence*, is a term used for the constitutions of several emperors; viz. Justin, Tiberius II., Leo, and particularly Justinian.

Most of Justinian's Novels were originally Greek, and afterwards were translated into Latin. Their number is 168, comprised in nine collections or chapters. See *CIVIL Law*.

They had their name novel, either from their making a great alteration in the face of the ancient law; or, as Cujas rather thinks, because made on new cases not yet considered; and, after the revival of the code, compiled by order of the emperor.

Wherever Accursius speaks of novels, he means those published in Greek by Justinian: the Latin version of them, made in the time of Bulgarus, he calls *Authentics*, by reason of its exactness and fidelity.

NOVEL, in *Matters of Literature*, a fictitious history of a series of surprising and entertaining events in common life, wherein the rules of probability are, or ought to be, strictly observed; in which it differs from a romance, where the hero and heroine are some prince and princess, and the events which lead to the catastrophe are, in general, highly absurd and unnatural.

After a general change in the manners of Europe, a disbelief in magic and enchantments, the abolition of tournaments, and the prohibition of single combat, had destroyed or greatly weakened the fondness for romances of chivalry, a second species of romance writing took its rise. In this there were no longer introduced dragons, necromancers, or enchanted castles, but with them was not entirely banished absurdity of incident and improbability of character. This second species of fictitious writing did not continue long: the age was becoming too refined, and the taste for literature too general and extensive, for works to please in which the characters were strained, the style turgid and declamatory, and the adventures incredible. This sort of composition now assumed a third form, and from the magnificent romance, dwindled down to the familiar novel. When the novel first appeared in England and France, during the reigns of Louis XIV. and Charles II., it was made the vehicle for profligate adventures, and for the display and recommendation of loose and immoral character. Since that time, imitations of life and manners have been their principal object, and though their moral or beneficial tendency may often be questioned, yet their professed object is to instruct as well as to amuse.

Mrs. Barbauld, in her observations on the life and writings of Richardson, remarks, that novels may be distinguished into three classes, according to the mode and form of narration adopted by the author: the first is the narrative or epic form, in which the whole story is put into the mouth of the author, who is supposed to know every thing; the second is that in which the hero relates his own adventures; and the third is that of epistolary correspondence, in which all the

principal characters of the novel relate the events in which they were most concerned. This last mode appears to have originated with Richardson. With respect to the advantages and disadvantages of these different modes, and the comparative probability of a person sitting down, after his adventures were finished, to give an account of them to the public, and of his dispatching a narrative of every interesting occurrence, immediately after it happened, to his friends by the post, Mrs. Barbauld enters into a minute investigation. It is probably a question of little moment, since, if the novel be interesting and well written, the reader will not be disturbed in the middle of the story, by any curiosity or scruple about the means or the inducements which the narrator may have had for telling it. Perhaps the first of these modes, the author's own narrative, is the most eligible, as it gives him greater scope, and allows him to introduce greater variety in his mode of narration, and in his style. The epistolary style, however, is best adapted to that species of novel in which the characters, and not the adventures of the persons introduced, are intended principally to rouse, and fix the interest of the reader; it is, therefore, employed with great propriety and effect by Rousseau, in his *Heloise*.

The French undoubtedly excel all other nations in this species of writing; if its chief excellence and merit consist in drawing characters with delicacy, in exquisite refinement of thought, and in great penetration into human nature. The English novel writers are more distinguished by their skill in painting manners than character, and by their humour, rather strong and coarse, than chaste and elegant. The German novel writers, in general, display force and wildness of genius; a deep tincture of ferocity; and a disposition to carry every feeling and sentiment to the utmost possible degree of extravagance and excess. Their opinions respecting morality are of a singular nature, and of a very questionable tendency: it might almost be suspected that their object was to recommend vice, or crime, by exhibiting it united with great vigour of mind, splendour of genius, and even with some interesting and attractive virtues.

The *Gil Blas* of Le Sage is filled with great knowledge of the world; and is evidently the work of a man who had studied human nature, under certain circumstances, with great attention and skill: but his turn for satire is so strong and predominating, that a tinge of caricature runs through the whole work. One of the chief advantages and excellencies of *Gil Blas*, consists in the correct and animated view which is given throughout it, of the manners and habits of life, in Spain, during that period when the action is laid; nor is it possible to conceive a more striking and just picture than it exhibits, of the corruption of justice, of the extreme laziness and profligacy of the grandees, and of professional pedantry, presumption, and unskilfulness. In this respect Le Sage may be regarded as having supplied a too common omission of the historian, who passes over the changes of human manners and character, and confines his attention to those events and circumstances only, which interest or benefit the politician.

But the novels of Le Sage do not present a faithful picture of the characteristic qualities and excellencies of the French authors in this species of writing. In this point of view Marivaux claims our attention in a very superior degree: in his *Marianne*, particularly, he seems to have penetrated into the very recesses of the human heart, while he lays open those most secret motives, which, even though they influence the conduct, are not known or recognized by the agent in all their force and bearings. Perhaps his fault consists in being too minute and refined in tracing the motives and painting the feelings of his character. The novels of Florian have

more simplicity than those of Marivaux, while they are equally interesting from the skill with which the narrative is conducted, the vividness and animation with which the incidents are related, and the faithful portraits which they exhibit of human nature, in some of its most pleasing and amiable forms.

Rousseau's novels, as well as those of Le Sage, form exceptions, in some very important respects, to those of the French school of novel writers; but the difference is of a very different nature; and even in the most splendid and eloquent parts of Rousseau's novels, the characters of the French school may be traced. He does not indeed paint his characters by minute and laboured features: but with the hand of genius, he strikes off the portrait, by the rapid and flowing exhibition of those features, on which the soul is most strongly expressed. His novels also are uncommonly interesting, from the insight which they afford into the author's own character; though there is so little appearance of art in his writings, that the idea of the skill or talents of the writer does not cross our mind, or break in upon our thoughts or feelings, while we are warm in the perusal; yet we no sooner lay down the book, than a strong impression of the peculiar character of the author forces itself on our mind. In every thing which he wrote, but especially in his *Héloïse*, we discover extreme and exquisite sensibility, a romantic and visionary turn of mind, and genius of the highest order and purest nature. In his *Héloïse*, there are, no doubt, considerable faults; in what Rousseau intended for the philosophical parts, there is much sophistry, and not unfrequently a tedious and obscure weakness of argument. The style of the letters, also, is not sufficiently varied, in the less impassioned parts: he did not, indeed, succeed nearly so well in the display of reasoning and calm, as of feeling and impassioned character. But with all these deductions from its merit, the *Héloïse* must be ranked among the most successful and splendid creations of human genius; and there are passages in it, which for power of eloquence, for refinement and tenderness of sentiment, for ardour of passion, and for exquisite delineation of character, cannot be paralleled in any other writer.

The circumstances which gave rise to this most extraordinary work are detailed by Rousseau in his memoirs; and as they are extremely interesting, from the display which they exhibit of the workings of his imagination, and the extreme and morbid sensibility of his feelings, we shall briefly detail them. Tired of Paris, he withdrew to a small country house near it; where he shut himself completely up from all visitors, indulging his taste for solitude and visionary enjoyments. Here he describes himself as having been seized with the most violent propensity to love; but as his age and situation precluded him from having a real mistress, he created an imaginary one, whom he adorned with every charm that a flowing and most creative fancy could supply. At length he commenced a correspondence with his imaginary mistress; and the letters, thus written, pleased him so much, that he determined to publish them. As, however, the sentiment which they expressed, and the feelings which they displayed, were very opposite to the severe and stern maxims which he had formerly inculcated, he was, at first, at a loss for a justification of his conduct in publishing them. Here, again, his imagination, and his disposition to sophistry, came to his aid: he persuaded himself that the times were such, that the *Héloïse* would be more useful than works conducted with a stricter regard to morality. He did not conceal from himself the objections that might be made to it, nor the effects that it might produce; but he urges, that the disorder of which it presents an example was

less dangerous and criminal than that which had become common in France: as, therefore, he despaired of freeing human nature from vice, he resolved to content himself with substituting one species of crime for another. He argues too, that in the generality of fictitious writings, the standard for imitation had been raised too high; that it thus created despair, not emulation; but that in his *Héloïse*, human nature is exhibited only with that degree of perfection which all may attain to, while the nature of the perfection, and the circumstances under which the characters are exhibited, will naturally inspire a wish to imitate them.

The novels of Richardson are of a very peculiar character; and as they cannot be strictly classed with any other English novels, it will be necessary to consider them by themselves, and at some length. Certainly his great excellence consists in the extreme minuteness and fulness of his descriptions; and in the pains which he takes to make his readers most intimately acquainted with the character and feelings of the personages with whom they are occupied. Instead of hurrying over the preparatory scenes, and reserving the whole of the reader's attention for those parts, when a grand display of incident is to be brought forward, or the working of some great passion is to be portrayed, Richardson introduces his readers into the domestic privacy of his characters, and every thing that is said or done, is thus, as it were, heard and seen by them. The result is, that we take an interest in all the personages, and almost acknowledge them as our most intimate acquaintance. In order to effect this, Richardson has been obliged to enter into prolix descriptions, and to repeat rambling and tedious conversations: in the midst of these, the reader is frequently tired or disgusted, but they nevertheless leave on his mind a more distinct idea of the character of the personages, and give them a stronger hold, not only on his curiosity, but his interest. When, therefore, any thing important or disastrous occurs to them, we feel as for old friends and companions, and are irresistibly led to as lively a conception of their sensations, as if we were actually present. By this means Richardson has the advantage of bringing readers, already interested in the highest degree, to the perusal of those scenes, where his knowledge of the human heart, and his powers of pathetic description, are brought forward to the greatest advantage and effect.

With all the merits of Richardson's novels, they have great faults: the argumentative discussions which he introduces are tedious and heavy, and display no great or comprehensive powers of mind; his wit is stiff and formal, evidently brought forward with much effort, and scarcely ever either lively or natural. His style is heavy, vulgar, and embarrassed, devoid of ease, elegance, or dignity: Mrs. Barbauld has very ingeniously and satisfactorily accounted for this, from his intimacy with female society and female letter-writing. With regard to the moral tendency of his works, it is probably not so highly rated now as it was at the time they were written: on this score *Pamela* cannot be defended; and virtue will hardly attract in the character of sir Charles Grandison, nor vice be so warmly and strongly abhorred as it ought to be, in the character of Lovelace.

In the novels of Fielding and Smollet, the genuine character of English novel-writing appears in the most distinct and marked manner; yet these authors differ from each other in several important points. Fielding is remarkable, rather for humour than wit; and his humour is coarse and strong, not refined and delicate: the characters which he draws are certainly lively and natural, but they are such as require rather an acquaintance with manners, and with the influence of particular

particular conditions and occupations, on the opinions, disposition, and conduct, than an insight into the more secret workings of the human mind and heart. This observation will not be deemed severe or unjust by those who compare those parts of his novels where his favourite characters are introduced, such as ostlers, innkeepers, waiting-maids, rogues, and female demireps, with those which called for the display of characters of more refined sentiments and feelings, or acting under the influence of the more powerful emotions and passions of the heart. The greatest merits of Fielding's novels, more particularly of *Tom Jones*, consists in the exquisite skill with which he conducts the fable; the subserviency of every incident to the furtherance of the plot, and his art in keeping alive the curiosity of the reader. His style is languid and tame, exhibiting a good deal of pedantry and affectation; and that the digressions, which he introduces, are at least out of place, is sufficiently proved by the total neglect which they experience from every reader. The moral tendency of his novels is bad: benevolence, generosity, and disinterestedness, are, no doubt, strongly inculcated; but in novels, the examples which are held out have a more powerful and extensive influence, than the lessons which are taught, or the moral maxims which are laid down; and if his hero, in his most favourite novel, is disinterested and benevolent, it is rather from want of thought, and from the overwhelming influence of strong passions, by no means of a virtuous description, than from principle and conviction.

If we were to compare the most popular novels of Smollet with those of Fielding, we should be disposed to ascribe the highest degree of excellence in this species of writing to the latter. In *Roderic Random*, and *Peregrine Pickle*, manners rather than character are depicted; and in the display of them, the acuteness of the author's observation is much more remarkable than its extent and variety. The humour of Smollet is still coarser than that of Fielding, and his objectionable scenes are brought forward with more grossness; while there is none of that refined generosity and those just sentiments, at least of moral conduct, with which Fielding invests his heroes. On the other hand, the novels of Smollet, particularly *Roderic Random*, are more full of instructive knowledge of the world, and are written in a much more animated, lively, and natural style. But it is in *Humphrey Clinker* that Smollet appears to the best advantage: it is not, perhaps, going too far to assert, that the character of *Matthew Bramble* is as exquisitely and finely drawn, as any character exhibited in fictitious writing. The idea which Smollet formed to himself of this character, is complete and consistent in all its parts; and there is not a sentiment uttered, not a feeling expressed, nor an action performed by *Matthew Bramble*, but what is perfectly in character. An acute and vigorous intellect, a warm and benevolent heart, are united to odd and eccentric humour, a quick irritability of temper, and a retiring shyness of disposition. He is so afraid of being known for what he really is, that he takes as much pains to appear, and be deemed morose and selfish, as most men would do to conceal those qualities. In short, the character of *Matthew Bramble* not only displays an intimate acquaintance with the human heart, but also with those peculiar manners, which so frequently mark out, very distinctly, the British philanthropist.

Goldsmith has written only one novel; but that, in every point of view, is an exquisite one: while the *Vicar of Wakefield* displays almost unequalled humour, of the purest and highest nature, it also contains passages that are irresistibly pathetic. Nothing can be conceived more perfectly drawn than his character of *Doctor Primrose*; it is a truly English

character, exhibited, where such a character appears to the greatest advantage, at home, by his fire-side, in the midst of his family. Indeed, the great merit, and the most powerful and attractive interest of this novel, consists in its display of domestic feelings. The fable of the *Vicar of Wakefield* also deserves much commendation; all the personages are conducted through their various vicissitudes, in the most natural manner; the events are striking, yet simple and probable; and the conclusion is brought about without the least appearance of exaggeration or force. Of the style, it may be sufficient to say, that it fully merits the praise which Johnson bestowed on Goldsmith's writings; *nihil quod tetigit, non ornavit*.

Before proceeding to the consideration of the sentimental class of novels, it may be proper, very briefly and rapidly, to characterise the novels of Cumberland, Moore, and Burney. Cumberland evidently imitates Fielding; but he is inferior to him in humour, in the nice delineation of manners and character, and in the structure and management of his fable: while he excels him, in presenting a more extensive view of human life, in pathetic description, and in chasteness and elegance of style. It is a remarkable, unaccountable, but lamentable fact, that the "*Terence of England*," as Cumberland has been styled, delights, in his novels, in painting scenes of voluptuous profligacy, equally reprehensible with those of Fielding, and much more dangerous, because less gross and vulgar. In the novels of Dr. Moore, great knowledge of the world, and of national character, are displayed; and the more difficult task of depicting the stronger passions, is performed with considerable skill and effect. His humour is rather dry and caustic, than rich and sportive; his style is at once easy, natural, and animated. Perhaps his distinguishing excellence consists in the almost total absence of exasperation and caricature in his personages; the real features of human life are drawn with so much discrimination and distinctness, that, in order to be interesting or recognised, they did not require to be heightened by caricature: on this account, the novels of Dr. Moore will supply the place of experience more effectually, and with less danger of disappointment, or being led astray, in actual intercourse with the world, than the novels of any other author. Praise of a similar nature cannot be bestowed on the novels of Miss Burney; caricature pervades almost every feature of all her personages, and occasionally a species of buffoonery is indulged in, by no means consistent with that purity of mind, and elegance of taste, which she generally exhibits. But with all these deductions from the merits of her novels, they still must rank high; *Evelina* certainly in the first class; *Cecilia* (except in the serious and pathetic parts) below *Evelina*; and *Camilla* very far below both.

The general character of the German novels has been already sketched, and when the sentimental description of novels is considered, it will be more particularly described. There are, however, some exceptions to this character among the novel writers of Germany; and *Augustus Fontaine* deserves in an especial manner to be excepted. His *Clara Duplessis*, and his *Family of Halden*, deserve great commendation; they display considerable talents of observation, and an intimate acquaintance with the feelings and workings of the human heart. In his *Family of Halden*, he seems to have set before him as his models *Sterne* and *Goldsmith*, and he has certainly imitated them with no small degree of success; his imitation, perhaps, is in some respects improperly close, as the English cast of manners is too visible. Many of his subsequent novels are of very inferior merit.

About the middle of the last century, a new species of fictitious

fictional writing took its rise, called the sentimental; it consisted, principally, in the exposure and delineation of certain minute and delicate sensations, which either have no existence, or pass unnoticed, in active and busy life. The most celebrated writers of this species of novel, are Sterne and Goethè. Sterne possesses wit and humour, intermingled with no small share of disgusting and profligate buffoonery; the sentimental parts of his writings are of very different merit; wherever he is entirely filled with his subject, so that he forgets his affectation of feeling and sentiment, he is most touchingly pathetic, and exhibits a proof of a literary maxim, which he too often neglected, that simple and natural incidents, if told in correspondent language, have more command over the feelings and sympathy of the reader, than scenes of extraordinary and accumulated distress, portrayed in figurative and strained language. It may, however, justly be doubted, whether indolent and passive sympathy, rather than active and discriminating benevolence, will not be generated by the perusal, even of the finest passages in Sterne's novels.

Perhaps few novels were ever more popular than the Sorrows of Werter were, at one time; but their popularity has been long on the wane. It is a sentimental novel of a very different class from the writings of Sterne; being distinguished rather by strong and boisterous passion, than by delicate and shrinking sensibility; and while an indolent languor of feeling is produced by the latter author, the perusal of the novel of Goethè is calculated to stimulate an ungovernable temper, impatience of restraint, and contempt for all the sober and rational maxims of life. The sensibility portrayed and recommended by Sterne is justly censurable, as indulging too much in what may be termed the luxury of grief; as directed to, and expended upon improper and unworthy objects, and as totally incompatible with that enlightened and vigorous benevolence, which alone can exercise and improve the mind and heart, and confer a real blessing on mankind: but the selfishness which lurks in it, is by no means so gross as the selfishness of the hero of the Sorrows of Werter. He is indeed feelingly alive to every incident and impression, but only so far as they are connected either with his own happiness, or with the happiness of that being in whom he has centered his own. While, however, the Sorrows of Werter must be condemned on this account, they deserve high praise for the display of genius which they exhibit; genius indeed not regulated by sober judgment, or a refined taste, but partaking, in a high degree, of that impetuosity and extravagance, which always distinguish it in a barbarous age.

From this view of some of the best authors in the highest class of novel writing, it will be abundantly evident, that the perusal of these works is more calculated, and apt, to be prejudicial than advantageous, unless the mind is previously fortified with sound principles, and the passions and feeling are completely under the mastery of the judgment. Even then, their claim must rest, rather on the interest which they excite, than on the instruction which they afford. Whoever draws his opinions of the world, of the manners, characters, and pursuits of mankind, from novels, will enter on real life to great disadvantage; the personages of novels, especially of those which teem from the modern press, either bear no resemblance to mankind, or that resemblance consists in such a narrow peculiarity of feature, as renders it rather an individual than a general picture. But the strongest and most undoubted objection to novels, arises from the effects which the perusal of them produces on the mental faculties, and the literary taste; during it the mind is nearly passive; a lounging, desultory habit of reading is acquired, so that when

works are to be perused which require close and regular attention, and a judgment constantly on the alert, to follow and comprehend the author's observations and arguments, the mind is unequal to the task. The literary taste will suffer equally, except the reading be confined to a very few select novels: unless, therefore, the habits of close, active, and vigorous attention are of a very powerful and predominating nature, and the taste has been modelled to correctness and purity, by long and regular discipline, novels ought to be avoided: where these preparatives exist, their perusal cannot do harm; it will interest, if it does not instruct; it will never be indulged in to an improper extent, and it will restore the mind to more sober and useful studies, with greater relish and renewed freshness.

NOVEL *Assignment*, in an action of trespass, is an assignment of time, place, or the like, in a declaration, otherwise or more particularly than it was in the writ.

NOVEL *Disseisin*. See ASSISE of novel disseisin.

NOVELDÀ, in *Geography*, a town of Spain, in the province of Valencia; 15 miles W. of Alicant.

NOVEMASTO, a town of Austrian Poland, in Galicia; 40 miles W.S.W. of Lemberg.

NOVEMBER, the eleventh month in the Julian year, but the ninth in the year of Romulus; whence its name.

NOVEMIASECZKO, in *Geography*, a town of Samogitia; 26 miles N.E. of Medniki.

NOVEMPOPULANIA, in *Ancient Geography*, a province of Gaul, towards the south-west.

NOVEMSILES, or NOVENSILES, in *Mythology*, a species of gods worshipped among the ancient Romans.

The *dii novemfiles* were the gods of the Sabines, adopted by Romulus; and had a temple built to them, in consequence of a vow, by king Tatius.

Some antiquaries take the name to have been given to those heroes who were last placed among the number of the gods; as Hercules, Vesta, Sanctity, Fortune, &c.

NOVEMVIRI, an order of magistrates at Athens, nine in number.

The *novemviri* were the chief magistrates of the city; their office only held for one year. Their chief was called *archon*, whose name was recorded in the Athenian feasts; as, at Rome, that of the consuls.

The second bore the title of *basileus*; the third, of *polemarcha*, i. e. chief of the troops; and the remaining six, of *thesmophetes*.

NOVENDIALE, or NOVEMDIALE, in *Antiquity*, a solemn sacrifice among the Romans, held on occasion of any prodigies appearing to menace them with ill fortune.

It had its name from the term of its celebration: *viz. novem dies, nine days*.

NOUER L'EGUILLETTE, in the *Manege*. See YERKING.

NOVES, in *Geography*, a town of Spain, in New Castile; 16 miles N.N.W. of Toledo.

NOUGARSEK, a town of East Greenland. N. lat. 61° 14'. W. long. 45° 30'.

NOVGOROD, or NOVOGOROD, a city of Russia, and capital of a government, on the river Volchova, at the N. end of the lake Ilmen; the see of an archbishop. This is one of the most ancient cities in Russia, and was formerly called "Great" Novogorod, to distinguish it from other Russian towns of a similar name. According to Nestor, the earliest of the Russian historians; it was built at the same time with Kiof, in the middle of the fifth century, by a Slavonian horde, that issued from the banks of the Volga. In the ninth century Ruric, the first great duke of Russia, made this city the metropolis of his dominions; and though the

the seat of government was removed to Kiof in the year 879, the next year after his death, Novogorod continued for more than a century under the jurisdiction of governors, nominated by the great dukes. In 1036, Yaroslav, son of Vladimir, who occupied the throne of Russia, granted to the inhabitants considerable privileges, that laid the foundation of their liberty. The dukes of this city, who were at first subordinate to the great dukes, who resided at Kiof and Volodimir, gradually usurped, as the place advanced in wealth and population, an absolute independency. They were, however, unable to maintain their authority over their own subjects; so that Novogorod was a republic under the jurisdiction of a nominal sovereign. The privileges of this town proved very beneficial to its real interests; and it became the great mart of trade between Russia and the Hanseatic cities, and made rapid advances in opulence and population. Its territory extended as far as the frontiers of Livonia and Finland, and comprised great part of the province of Archangel, and a large district beyond the north-western limits of Siberia. So extensive were its dominions, so great its powers, and so impregnable its situation, as to give rise to a proverb, "who can resist the gods, and Great Novogorod?" In the year 1471, Ivan Vassilievitch I. asserted his right to the sovereignty of this principality, and having vanquished the troops of the republic, forced the citizens to acknowledge his claims, and appointed a governor, who was permitted to reside in the town, and exercise the authority formerly vested in their own dukes. But at this time, they retained their own laws, chose their own magistrates, and the governor never interfered in public affairs, except by appeal. Ivan, not satisfied with this limited government, proceeded to extend his authority, and in 1477 laid siege to the town. The subjugation of the citizens was so complete, that it was evinced by the removal of an enormous bell from Novogorod to Moscow, denominated by the inhabitants "eternal," and revered as the palladium of their liberty, and the symbol of their privileges. Nevertheless, subject as it afterwards was to the despotism of Ivan, and his successors, it still continued to be the largest and most commercial city in all Russia. It is described accordingly by Richard Chancellor, who passed through it in 1554, on his way to Moscow. In its most flourishing condition, it contained at least 400,000 souls. In 1570, a conspiracy having been discovered against the government of Ivan Vassilievitch II., he repaired thither in person, and appointed a court of inquiry, justly denominated the "tribunal of blood." On each day, during the interval of five weeks, more than 500 inhabitants fell victims to the vengeance of incensed despotism. According to some authors, 25,000, and as others say, 30,000 persons perished in this dreadful carnage. By this catastrophe, and subsequent oppression, Novogorod was considerably impaired, both with regard to strength and splendour; but it was not totally obscured, until Petersburg was founded, and Peter the Great transferred thither all the commerce of the Baltic, which had before centered in this city. The present town is surrounded by a rampart of earth, with a range of old towers at regular distances, forming a circumference of about one mile and a half; within which inclosure are many uninhabited houses, and much open space. It stretches on both sides of the Volkof, which is a beautiful river of considerable depth and rapidity, somewhat broader than the Thames at Windsor, and separating the town into two divisions, *viz.* the Trading part, and the Quarter of St. Sophia, which are united by a bridge, partly wood, and partly brick. The former division comprehends, if we except the governor's house, a rude cluster of wooden habitations, presenting ruined remains of ancient grandeur.

The latter division derives its appellation from the cathedral of St. Sophia, completed in 1051, and includes the fortrefs or Kremlin, which contains the cathedral, with some other buildings, besides a waste space, overspread with weeds and nettles, and covered with ruins. The entrance into the cathedral has a pair of brazen gates, ornamented with various figures in alto relievo, representing the passion of our Saviour, and other scriptural histories. Within are twelve maffy piers, which, as well as the walls, are thickly covered with the representation of our Saviour, the Virgin Mary, and of various saints. Some of these paintings are very ancient, and probably anterior to the revival of the art in Italy. Several princes of the ducal family of Russia are interred in this cathedral. According to Heym, Novogorod, in 1783, contained 62 churches, 6 convents, and exclusively of 12 public buildings, 1512 houses, of which only 39 were of brick. The population amounted to 3342 males, and 3784 females; 92 miles S.S.E. of Petersburg. N. lat. 58° 35'. E. long. 30° 44'. Coxe.

NOVGOROD, *Niznei*, a town of Russia, and capital of a government, situated at the conflux of the Oka and Volga; built in the year 1222, and containing two cathedrals, twenty-eight parish churches, mostly of stone, and five convents; an archbishopric, and having a castle surrounded with stone walls. The trade is considerable, and the shops, richly stored with home and foreign goods, make a handsome appearance; 492 miles E.S.E. of Petersburg. N. lat. 56° 18'. E. long. 48° 54'.

NOVGOROD, *Sieverfko*, a government of Russia, bounded on the N. by the governments of Smolensk and Mogilev, on the N.W. by Mogilev, on the S.W. and S. by Tchernigovskoi, and on the E. by the governments of Orlov, Kursk, and Charkov; about 160 miles in length, and from 60 to 72 in breadth. N. lat. 50° 50' to 53° 25'. E. long. 31° 24' to 34° 34'.—Also, a town of Russia, and capital of a government. N. lat. 52°. E. long. 33° 14'.

NOVGORODSKOI, a government of Russia, so called from Novgorod, its capital, bounded N. by Olonetz, N.W. by the government of Petersburg, on the S.W. by that of Pikov, S.E. by that of Tver, and E. by that of Vologda; its length being about 320 miles, and mean breadth about 160. N. lat. 57° 10' to 61° 10'. E. long. 29° 39'.

NOVI, a fortified town of Croatia, on the left bank of the Unna; 45 miles S.E. of Carlsbad.—Also, a town of the Ligurian republic; 24 miles N. of Genoa. N. lat. 44° 47'. E. long. 8° 48'.

NOVIA BUNDER, a town of Hindoostan, in Guzerat; 45 miles N.W. of Puttan Sumnaut.

NOVICE, a person not yet skilled or experienced in an art or profession.

In the ancient Roman militia, *novicii*, or *novitii*, were the young raw soldiers, distinguished by this appellation from the veterans.

In the ancient orders of knighthood there were novices, or clerks in arms, who went through a kind of apprenticeship before they were admitted knights.

NOVICE is more particularly used in monasteries, for a religious, yet in his, or her year of probation, and who has not made the vows.

In some convents the superior has the direction of the novices. In nunneries the novices wear a white veil, the rest a black one.

A novice is not esteemed dead in law, but is capable of inheriting till the time of actual profession; nor can his benefices be taken away during the year of probation, without his consent.

The council of Trent prohibits a novice from assigning

over his benefices, till two months before the expiration of his year of probation; and he may even resume them, if the profession be null.

A novice is not allowed to make any donation to his superior, by reason of the dependence he is under.—Novices may either quit the convent during their noviciate, or may be turned off by the convent.

NOVICIATE, a year of probation, appointed for the trial of religious, whether or no they have a vocation, and the necessary qualities for living up to the rule; the observation whereof they are to bind themselves to by vow.

The noviciate lasts a year at least; in some houses more. It is esteemed the bed of the civil death of a novice, who expires to the world by profession.

NOVICIATE is also used for the houses or places where novices are instructed.

In this sense the noviciate is frequently a cloister separate from the grand dormitory.

NOVIGRAD, in *Geography*, a town of Hungary, with a castle, which gives name to a county; 14 miles E. of Gran.—Also, a town of Sclavonia, 45 miles N. of Kralivavetlika.—Also, a town of Dalmatia, situated on a bay to which it gives name; 16 miles N. of Scardona. N. lat. 44° 28'. E. long. 17° 32'.

NOVIGUNGE, a town of Hindoostan, in Doonab; 30 miles W. of Canoge.

NOVIODUNUM, in *Ancient Geography*, a town of Lower Mœsia, at the place where the Danube separates into various branches. According to Ptolemy it is on the route from Nicomedia to Arrubium, between Dinigullia and Ægison, 20 miles from the former, and 28 from the latter.—Also, a town of Pannonia, upon the route from Æmona to Sirmium, between Prætorium Latovicorum and Quadratum, one mile from the first, and 28 miles from the second.

NOVIOMAGUS, LIZIEUX, a town of Gaul, in the second Lyonnensis. It was the capital of the Lexovii, from whom it took its name.—Also, the ancient name of Spire, of Nimeguen, and of Noyon.

NOVION-PORCIEN, in *Geography*, a town of France, in the department of the Ardennes, and chief place of a canton, in the district of Rethel; six miles N. of Rethel. The place contains 1039, and the canton 11,243 inhabitants, on a territory of 222½ kilometres, in 31 communes.

NOVIOREGUM, ROYAN, in *Ancient Geography*, a town of Gallia Aquitania, between Tamnum and Mediolanum Santonum, 12 miles from the first, and 15 from the second. Anton. Itin.

NOVISILLO, in *Geography*, a town of Hungary, on the Danube; four miles S.W. of Bacs.

NOVITA, or *Real el Novita*, a town of South America, capital of a district in the viceroyalty of New Grenada, annexed to the province of Choco; 160 miles N. of Popayan. N. lat. 5° 4'. W. long. 76° 16'.

NOVLENSKOI, a town of Russia, in the government of Vologda, near the lake Kubenskoe; 32 miles N.W. of Vologda.

NOUN, NOMEN, in *Grammar*, a name or word which expresses the subject spoken of; or expresses a subject of which something is, or may be affirmed; as man, food, whiteness, Henry, &c.

A noun, therefore, in language, answers to an idea in logic.

The generality of subjects spoken of have particular names; yet there are others, which, without being attached to the same particular subject, are yet real nouns.

Thus, besides the particular name which each person bears,

and by which others denote him, he gives himself another when he speaks of himself, as *I*, or *myself*.

It is only the more particular names that in grammar have retained the quality of nouns; the more general ones are called *pronouns*.

Nouns, again, are to be viewed in another light, *viz.* as divided into nouns *substantive*, and nouns *adjective*.

They are called *substantives*, when the objects they design are considered simply in themselves, and without any regard to their qualities.

They are called *adjectives*, when their objects are considered as clothed with any qualities.

But, in effect, the object is alone designed by the nouns substantives; which, in this view, are alone the proper nouns.

Adjectives, in reality, are only the modificatives of nouns; though in one view they may be considered as nouns; *viz.* as they do not so much represent a quality or circumstance of the object, as the object itself, clothed with that quality or circumstance. Nor must it be omitted, that a noun adjective frequently becomes a substantive: for as its nature is to express the quality of an object, if that quality happen to be the object itself spoken of, then, according to our first definition, it becomes a substantive.

Thus, if I say, a *good intention*, the word *good* is here an adjective, representing the intention as clothed with the quality of goodness; but if I say, *the good is to be chosen*, it is evident that *good* is here the subject spoken of, and of consequence is a noun substantive. Nor are there cases wanting, wherein nouns substantives become adjectives.

It is true, that in the common use of grammar, many nouns, that are really adjectives, are not reckoned as such; none being esteemed adjectives but those which, without any, or at least any considerable change in their inflexion and termination, are joined indifferently to nouns substantives of different genders.

Nouns are again divided into *proper* and *appellative*.

Nouns *proper* are those which express a particular thing or person, so as to distinguish it from all other things of the same kind; as Socrates.

Nouns *appellative* are those common to several individuals of the same kind; as man, angel, &c.

Nouns *heterogeneous*, are such as are of one gender in the singular number, and of another in the plural. See HETEROCLYTE.

NOVO MIRGOROD, in *Geography*, a town of Russia, in the government of Ekaterinoflav; 136 miles W.N.W. of Ekaterinoflav. N. lat. 48° 40'. E. long. 21° 44'.

NOVODVAR, a town of Hungary, four miles N. of Csakathurn.

NOVOGRIGOREVSKOE, a town of Russia, in the government of Ekaterinoflav; 72 miles N.W. of Cherfon.

NOVOGRODEK, a town of Russian Lithuania, in the palatinate of the same name, otherwise called "Black Russia," situated on a hill, not large, but including several Russian and Popish convents. Besides a provincial elect, and inferior court of judicature, a high tribunal, like that of Wilna, is held alternately here and at Minsk, which continue sitting for five months every year; 68 miles E. of Grodno. N. lat. 53° 33'. E. long. 26°.

NOVOI, a small island in the Caspian sea; N. lat. 44° 50'. E. long. 51° 54'.

NOVOMIASTO, a town of Poland, in the palatinate of Rava; 20 miles S.E. of Rava.

NOVOMOSKOVSK, a town of Russia, in the government of Ekaterinoflav, on the Dnieper; 16 miles N. of Ekaterinoflav. N. lat. 48° 30'. E. long. 35° 12'.

NOVOMST,

NOVOMST, a town of Russia, in the government of Novgorod Sieverskoe; 60 miles N.W. of Novgorod Sieverskoe. N. lat. $52^{\circ} 35'$. E. long. 22° .

NOVORZEV, a town of Russia, in the government of Pskov, on the river Uda; 64 miles S.S.E. of Pskov. N. lat. 57° . E. long. $29^{\circ} 26'$.

NOVOSEL, a town of European Turkey, in Romania, on the Mariza; 26 miles W. of Filipopoli.

NOVOSIL, a town of Russia, in the government of Tula; 44 miles S.S.W. of Tula. N. lat. $53^{\circ} 5'$. E. long. $36^{\circ} 54'$.

NOVOSLOVO, a town of Russia, in the government of Kolivan; 72 miles S.S.W. of Krasnoiarfk.

NOVOTZURUCHETNEVSKOI, a town of Russia, in the government of Irkutsk, on the Argun; 152 miles S.E. of Nertchinsk.

NOVOUSOLE, a town of Russia, in the government of Perm, on the Kama; eight miles S. of Solikamsk.

NOUP HEAD, a cape on the W. coast of the island of Westra. N. lat. 59° . W. long. $2^{\circ} 56'$.

NOUPRA, a mountain of Thibet; 51 miles S.W. of Laffa.

NOURDYA, a town of Persia, in the province of Khorasan; 108 miles S. of Meschid.

NOUREDDIN, or **NORADIN**, in *Biography*, sultan of Syria, was the son of Zenghi, a lieutenant of the Seljukian sultans, who had made himself the independent sovereign of Aleppo and Mosul. Upon the death of his father in the year 1145, he took possession of Aleppo, and fixed his residence there. Zenghi had obtained various successes against the Christian crusaders settled at Jerusalem and Antioch, and Nouredin continued the war with equal success. He gained a complete victory over Bohemond, prince of Antioch, who lost his life in the battle. He recovered several places of which the crusaders had made themselves masters, and adding to his dominions the cities of Emessa and Damascus, he extended his rule from the Tigris to the borders of Egypt. In many of his expeditions he was attended by his nephew Salaheddin, so famous afterwards in the history of the crusades under the name of Saladin, who, after his uncle's death, succeeded to the command, and in 1171 put an end to the dynasty of the Fatimites. Nouredin may be accounted the most powerful and prosperous of the Mahometan princes of his time. He died in 1174, after a reign of twenty-nine years. He was illustrious, not only for his civil and military talents, but for all the virtues that can adorn a throne. No prince surpassed him in regard to justice, and to the rights of his subjects of all ranks, and to him is attributed the first institution of a chamber of equity for the purpose of securing the lower classes against the oppressions of the higher. The grateful feelings of his people towards him, on this account, were shewn after his death; thus a poor man, unable to obtain redress for an injury, went about the streets of Damascus crying aloud, "O Nouredin, Nouredin, where art thou now?" His economy, with regard to his private expences, was worthy of the primitive ages, and was founded upon a sense of the duty of a sovereign to spare the property of his people. But in every thing relating to the public welfare, his liberality was boundless. He founded a number of colleges, hospitals and mosques, and rebuilt the walls and edifices of several of the principal cities of his dominions, which had suffered severely from an earthquake. He was extremely religious according to the rules of his faith, yet is said to have been entirely free from bigotry and intolerance. Univer. Hist.

NOURISHING CLYSTERS. See **CLYSTER**.

NOURISHMENT. See **NUTRITION**.

NOURRIR *les Sons*, to swell, cherish, and sustain sounds to the last moment of their value, instead of discontinuing them before their time is expired; as is often done. There are movements which require every note to be sustained, and others that require the tones to be cut short, detached, and only touched with the point of the bow.

NOUS SHEHR, in *Geography*, a town of Asiatic Turkey, in Caramania, anciently called "Nyssa;" 40 miles S.E. of Kir-Shehr.

NOUSIS, a town of Sweden, in the government of Abo; 10 miles N.N.W. of Biorneborg.

NOUSKERY, a town of Hindoostan, in Lahore; 55 miles S.S.W. of Lahore.

NOUTRA, a town of Poland, in the palatinate of Cracow, on the frontiers of Hungary, near which are some gold mines; 30 miles S. of Cracow.

NOUTROKOOAGAN, a river of Canada, which discharges itself into St. John's lake. N. lat. $48^{\circ} 26'$. W. long. $72^{\circ} 38'$.

NOUVION, a town of France, in the department of the Somme, and chief place of a canton, in the district of Abbeville. The place contains 623, and the canton 9856 inhabitants, on a territory of $202\frac{1}{2}$ kilometres, in 20 communes.—Also, a town of France, in the department of the Aisne, and chief place of a canton, in the district of Vervins; 13 miles N.W. of Vervins. The place contains 3357, and the canton 10,106 inhabitants, on a territory of 115 kilometres, in nine communes.

NOVUS Auris Musculus, in *Anatomy*, a name given by Fabricius to the muscle called by Albinus laxator tympani, and by others externus auris, and exterior.

Novus Portus, in *Ancient Geography*, a port on the southern coast of the isle of Albion, between the mouth of the river Trifanton and the promontory Cantrum, according to Ptolemy.

NOWA GRODLA, in *Geography*, a town of Poland, in the palatinate of Braclaw; 36 miles N. of Braclaw.

NOWADA, a town of Bengal; 22 miles S. of Ghidore.—Also, a town of Bengal; six miles S. of Curruckdeagh.—Also, a town of Bengal; 18 miles S. of Burdwan.—Also, a town of Bengal; 17 miles N. of Toree.—Also, a town of Bengal, at which is a pass across mountains; 15 miles S.E. of Ramgur.—Also, a town of Hindoostan, in Bahar; 20 miles S. of Bahar. N. lat. $24^{\circ} 53'$. E. long. $85^{\circ} 43'$.

NOWADAH, a town of Bengal; 54 miles N.E. of Ramgur.—Also, a town of Hindoostan, in Bahar; 30 miles E. of Gayah.—Also, a town of Hindoostan, in Doob; 30 miles E. of Canow.

NOWADEE, a town of Bengal; three miles S. of Koonda.—Also, a town of Bengal; 46 miles N.N.W. of Ramgur.

NOWADY, a town of Bengal; 16 miles W. of Doesa. N. lat. $22^{\circ} 58'$. E. long. $84^{\circ} 45'$.

NOWAG, a town of Silesia, in the principality of Neisse; eight miles N.W. of Neisse.

NOWAGEE, a town of Bengal; 20 miles N. of Palamow.

NOWAGONG, a town of Hindoostan, in Oude; 22 miles N.W. of Kairabad.

NOWAGUNGE, a town of Hindoostan, in Oude; 12 miles S.E. of Bahreitch.

NOWAGUR, a town of Bengal; 15 miles N.E. of Palamow.—Also, a town of Hindoostan, in the circar of Ruttunpour; 36 miles E. of Ruttunpour.

NOWANAGUR, a town of Hindoostan, in Bahar; 55 miles S.W. of Patna. N. lat. $25^{\circ} 23'$.

NOWAR,

NOWAR, a town of Hindoostan, in Bahar; 43 miles S.W. of Arrah.

NOWE, a town of Prussia, in the province of Pomerelia, on the Vistula; 40 miles S. of Dantzic.—Also, a town of America, in the state of Tennessee; 46 miles N. of Knoxville.

NOWECZEITLY, a town of Austrian Poland, in Galicia; 28 miles E. of Lemberg.

NOWECZELKO, a town of Poland, in Podolia; 64 miles N.W. of Kaminiecz.

NOWED, NOWE, *i. e.* *knotted*, in *Heraldry*, is applied to the tails of such creatures as are very long, and sometimes represented in coat-armour, as if tied up in a knot.

NOWELL, ALEXANDER, in *Biography*, a learned divine of the church of England, was born at Read, in Lancashire, in the year 1511. When only thirteen years of age, his progress in learning was so great, that he was entered of Brazen-nose college in the university of Oxford, where he prosecuted his studies with much success, and was admitted to the degree of B. A. in 1536, and to that of M. A. in 1540. Before he took the last-mentioned degree, he was elected fellow of his college. Having acquired a high reputation for learning and piety, and distinguished himself by his zeal in promoting the reformation, he opened a school in the city of Westminster, where he educated his pupils in Protestant principles. About the year 1550, king Edward VI. granted him a licence for preaching, and in the following year he was installed prebendary of Westminster. In the first parliament of queen Mary's reign, he was returned one of the burgesses for Westflow in Cornwall; but his election was declared void, it being determined that having, by his prebend, a voice in the house of convocation, he could not sit in the house of commons. He fled to the continent to avoid the persecution of the times, but upon the accession of queen Elizabeth, he was one of the first Protestant exiles who returned to England, and soon obtained considerable preferment. For thirty years together he preached the first and last sermons in Lent before the queen, "wherein," according to Anthony Wood, "he dealt plainly and faithfully with her majesty, without dislike," that is, he probably pleaded strongly against errors and practices, in which she did not feel herself involved, for when he attacked one of her favourite doctrines, she called aloud to him from her closet window, commanding him to retire from that ungodly digression, and to return to his text. In 1562 dean Nowell was chosen prolocutor of the lower house of convocation. In 1594 he was installed canon of Windsor; and in the following year he was elected principal of Brazen-nose college in Oxford. In the same year he was created doctor of divinity, with a right of precedence over all the doctors then in the university, both on account of his great age, and his high dignity in the church. He died in 1602, having reached the advanced age of ninety, and retained to the last the perfect use of his faculties. He gave an estate of 200*l.* *per ann.* for the support of scholarships in Brazen-nose college. He was author of several works, but that which is most known is a catechism, published by the unanimous approbation of the convocation. He drew up also a smaller catechism in Greek and Latin, which was translated into English and into the Hebrew language.

NOWELL, LAWRENCE, brother of the preceding, was also a clergyman of the church of England, and educated partly at Brazen-nose college, and partly at Cambridge. Like his brother he fled to Frankfort from the persecutions of queen Mary, and returned after her death, and was promoted to the deanery of Litchfield and the archdeaconry of Derby.

He also obtained prebends in the cathedral churches of York and Chichester. He died in 1576, at the age of sixty. He was deeply learned in antiquities, and particularly in the Saxon language and literature, being, according to Camden, the first who revived the study of it in this kingdom. Under his instructions the famous Lambarde made himself master of that tongue, and he is said to have availed himself of the assistance and notes of his tutor, when he wrote his work "De Præcis Anglorum Legibus." Mr. Nowell left behind him "A Saxon English Dictionary," in MS. still remaining in the Bodleian library at Oxford, of which Francis Junius had a copy when he compiled his "Etymologicum Anglicanum," and Somner made much use, when he wrote his "Saxon Dictionary." He made "Collections" from curious ancient historical manuscripts, which are preserved in the Cottonian library. Biog. Brit.

NOWELZACLO, in *Geography*, a town of Aland, in Galicia; 44 miles S.S.E. of Halicz.

NOWGONG, a town of Bengal; 21 miles E.S.E. of Nattore.

NOWIDWOR, a town of Lithuania, in the palatinate of Novogrodek; 68 miles S.W. from Novogrodek.

NOWLAYE', a town of Hindoostan, in the circar of Kitchwara; 20 miles S.W. of Ougein.

NOWOGROD, a town of Poland, in the palatinate of Braclaw; 24 miles S. of Braclaw.

NOWOPOL, a town of Poland; 56 miles N.N.W. of Cracow.

NOWOSICKLI, a town of Poland, in the palatinate of Chelm; eight miles W. of Chelm.

NOWT, in *Agriculture*, a provincial word sometimes applied to neat cattle.

NOWT-Herd, a provincial word signifying a cattle-herd, or keeper of cattle.

NOWYLARG, in *Geography*, a town of Poland, in the palatinate of Cracow; 40 miles S. of Cracow.

NOXON, NOXONTON, or *Nov Town*, a town of America, in Newcastle county, in Delaware; 21 miles N. of Dover.

NOY, WILLIAM, in *Biography*, an able and industrious lawyer, was born in or about the year 1577, at St. Buriens in Cornwall. At the age of sixteen he was entered of Exeter college, Oxford, whence he removed to Lincoln's-Inn to study the law. In this profession he rose to considerable eminence, and was chosen representative for Helston in two parliaments towards the close of king James' reign. At this period he exerted himself as a firm opposer of the arbitrary exertions of the royal prerogative. In 1625 he was elected a member of the house of commons for St. Ives, and in the parliament of that year under Charles I., and a succeeding one, he persisted in the same course of patriotic conduct. No man surpassed him in the diligence with which he sought all precedents favourable to parliamentary privilege, and detected all the oblique methods employed by former kings in raising money. Such was his influence in the house, and his popularity through the country, that it was thought desirable by the court to purchase him, and accordingly the place of attorney-general, conferred upon him in 1631, gave a complete turn to his mind, and brought him over to the royal party. From this moment he was among the most active servants of the crown in promoting every violent and arbitrary measure, and he executed his particular office with the most violent ferocity. He countenanced, defended, and justified the illegal exaction of ship-money; and his manners, so far from attempting to conciliate the people, over whom he held his sway, aggravated the odiousness of his public conduct, for he was haughty, rude, and cynical.

He at length became an object of public and universal hatred, and in that state died in the year 1634, at the age of fifty-seven. His ardour in the cause of tyranny caused him to be regretted by those labouring in the same wretched cause, and archbishop Laud thus speaks of his death in his diary: "I have lost a near friend of him, and the church the greatest she had of his condition, since she needed any such." He left behind him several works on legal subjects, as, "A Treatise of the principal Grounds and Maxims of the Laws of England;" "Perfect Conveyancer; or several select and choice Precedents;" "Reports of Cases in the Time of Queen Elizabeth, King James, and Charles I.;" "Complete Lawyer, or A Treatise concerning Tenures or Estates in Lands of Inheritance for Life, and other Hereditaments and Chattels, real and personal;" "Arguments and Law Speeches." Noy also left in MS. "Collections from the Records in the Tower, in support of the King's naval Privileges, and of the Privileges and Powers of ecclesiastical Courts."

NOYA, in *Geography*, a sea-port town of Spain, in Galicia, at the mouth of the Tambre, in a bay of the Atlantic. The principal trade is the building of ships; 19 miles W.S.W. of Compostella. N. lat. $42^{\circ} 50'$. W. long. $8^{\circ} 56'$.—Also, a river of Spain, which runs into the Robregat, near Martorell.

NOYANT, a town of France, in the department of the Maine and Loire, and chief place of a canton, in the district of Baugé; nine miles E. of Baugé. The place contains 464, and the canton 8990 inhabitants, on a territory of 320 kilometres, in 15 communes.

NOYEL, a river of Hindooistan, which rises in the mountains about ten miles W. of Coimbatore, and runs into the Cauvery; 10 miles N.W. of Carroor.

NOYER, a town of France, in the department of the Yonne, and chief place of a canton, in the district of Tonnerre; 11 miles S. of Tonnerre. The place contains 1896, and the canton 8469 inhabitants, on a territory of $317\frac{1}{2}$ kilometres, in 16 communes.

NOYERS, a town of France, in the department of the Lower Alps, and chief place of a canton, in the district of Sisteron; five miles W. of Sisteron. The place contains 931, and the canton 4289 inhabitants, on a territory of $262\frac{1}{2}$ kilometres, in eight communes.

NOYLAND POINT, a cape of England, on the N. coast of the island of Thanet; one mile W. of Margate.

NOYON, a town of France, in the department of the Oise, and chief place of a canton, in the district of Compiègne, seated on the Oise; before the revolution the see of a bishop, the capital of an election, and the residence of a governor, containing ten parish churches. This was the native place of the famous John Calvin. The place contains 6000, and the canton 13,168 inhabitants, on a territory of $117\frac{1}{2}$ kilometres, in 17 communes. N. lat. $49^{\circ} 35'$. E. long. $3^{\circ} 5'$.

NOZA, a small island near the W. coast of Madagascar. S. lat. $13^{\circ} 30'$. E. long. $40^{\circ} 9'$.

NOZAI, a town of France, in the department of the Lower Loire, and chief place of a canton, in the district of Chateaubriant. The place contains 2030, and the canton 7850 inhabitants, on a territory of 325 kilometres, in six communes.

NOZDRICE, a town of Poland, in Volhynia; 64 miles N.E. of Zytomiers.

NOZEROY, a town of France, in the department of the Jura, and chief place of a canton, in the district of Poligny; 12 miles S. E. of Salins. The place contains 785,
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and the canton 8221 inhabitants, on a territory of 205 kilometres, in 36 communes.

NOZLI, a town of Asiatic Turkey, in Natolia; 44 miles W. of Degnizlu.

NUAPEND, a town of Hindooistan, in the Carnatic; eight miles N.W. of Nellore.

NUAW, a town of Hindooistan, in Bahar; 24 miles W. of Arrah.

NUAYHAS, the *Ague-tree*, a name given by the Indians to a sort of bamboo cane, the leaves of which falling into the water, are said to impregnate it with such virtue, that the bathing in it afterwards will cure the ague. They use also a decoction of the leaves to dissolve coagulated blood, giving it internally, and, at the same time, rubbing the bruised part externally with it.

There seems something of fiction in the account of many particulars of this tree, in the Hortus Malabaricus, but it seems certain that the length of the stalks, or trunk, must be very great; for in the gallery of Leyden, there is preserved a cane of it of twenty-eight feet long, and another but little shorter in the Ashmolean Museum at Oxford, which is more than eight inches in diameter; yet both these appear to be only parts of the whole trunk, they being nearly as large at one end as at the other.

NUBAS, in *Geography*, a fort of the Tyrolese, for defending the passage of the Alps; six miles E. of Fueslen.

NUBECULA, *Little Cloud*, in *Medicine*, a term sometimes used for a disease in the eye, where objects appear as through a cloud or mist.

The nubecula seems to arise from certain gross particles detained in the pores of the cornea, or swimming in the aqueous humour, and thus intercepting the rays of light.

NUBECULA, or *Nubes*, is also used for what we otherwise call *albugo* and *pannus*.

NUBECULA is also used for a matter in form of a cloud, suspended in the middle of the urine. This they sometimes also called *enacorema*. See URINE.

NUBEDAM, in *Geography*, a town of Grand Bucharica; eight miles E. of Saganien.

NUBELOSA LINEA, a term used by the Latin writers on heraldry, to express a sort of clouded line in certain coats of arms. Our heralds call it *nebule*, and the French *nuance*. It is figured so as to represent clouds at the edge, and was given to the first of the families who bear it, as a token of their skill in astronomy and navigation.

NUBES, in *Natural History*, a word used by the ancients to express that whitish foulness which we frequently see in the bottom of the finest columns of crystal; we express this by the same word, *cloud*.

The columnar emeralds are subject to the same sort of foulness at the bottom; and this part was called the root of the emerald properly enough, as it was that end of the column where it grew to the stone; but the word root of emerald has been since applied to several very different substances of a green colour, and some degree of transparency.

NUBIA, in *Geography*, a town of Africa, in the country of Nubia, on the Nile, supposed to be the ancient Meroe; 360 miles N.E. of Sennaar. N. lat. $18^{\circ} 10'$. E. long. $34^{\circ} 54'$.

NUBIA, a country of Africa, bounded on the N. by Egypt, on the E. by the Red sea, on the S. by Abyssinia, and on the W. by unknown countries of Africa. Nubia is composed of several kingdoms, among which Sennaar and Dongola appear to be the most powerful, or at least they are best known. A considerable part of this

country along the coast, and of the territory that lies between Egypt and Dongola, is subject to the dominion of the Turks. Sandy deserts abound in this country, intermixed with various districts, especially those that are adjacent to the rivers, which are uncommonly fertile.

NUBIGENUM *Æs*, a term used by some historians to signify copper generated in the clouds, and falling from thence with rains, or in storms. They talk also of iron, and of stones produced the same way, and call them *ferrum nubigenum*, and *lapides nubigeni*.

Many of the German historians mention the falling of iron in dust, and in large pieces; and Avicenna tells us such things of Italy. Phil. Trans N° 156. See *Præternatural RAINS*.

NUBILES ANNI. See ANNI.

NUBLADA, in *Geography*, an island in the North Pacific ocean, with three small ones lying near it, S.W. of Cape Corientes, on the coast of Mexico. N. lat. 16° 40'. W. long. 122° 30'.

NUBLE, a river of Chili, which runs into the Plata, 20 miles from its mouth.

NUCAIL, a town of Africa; 70 miles S.W. of Fez.

NUCAMENTACEÆ, in *Botany*, the last section of the order of *Compositæ*, in the Natural Orders of Linnæus. The term is taken from one of the old appellations of a catkin, or *amentum*; but it is not easy to perceive the leading principle of this section, under which are ranged some true compound syngenesious plants, with others whose flowers are monoecious, the males being amentaceous, with perfectly distinct anthers, the females only compound or aggregate. The genera stand thus in the *Gen. Pl.* *Stoebe*, *Tarhonanthus*, *Artemisia*, *Seriphium*, *Erioccephalus*, *Filago*, *Micropus*, *Iva*, *Parthenium*, *Ambrosia*, *Xanthium*, *Strumphia*. To these are added in his manuscript *Hippia*, *Gnaphalium*, *Xeranthemum*, and *Clibadium*.

NUCAMENTUM, the ancient Latin name for the catkin, or pendulous string of flowers, for the most part male, as in the oak, fir, &c., for which Linnæus uses the term *Amentum*. See CATKIN.

NUCASSE, in *Geography*, a town of America, in the Tennessee state; five miles S. of Knoxville.

NUCERIA, NOCERA, in *Ancient Geography*, a town of Italy, in Campania, towards the S.E. The first colony that was conducted thither was in the time of Augustus.

NUCHA, the hinder part of the nape of the neck; called also *cervix*.

NUCHAN, in *Geography*, a town of Russia, near the sea, which separates the continent of Asia from America. N. lat. 66°. E. long. 189° 14'.

NUCHI, NUGHU, or *Scheki*, the capital of a country near the Caspian sea, called *Scheki*, and situated in the elevated ridge of mountains on the Kur. Nuchi consists of 300 houses, and is defended by a strong castle, formerly called Kara Hissar, at present Gallâsin Görâsen, which resisted the victorious troops of Nadir Shah. The population of the city and of the village belonging to it amounts to about 2800 families. To the S. of Nuchi, on the bank of the Kur, lies a large and flourishing market-town, called *Akdasch*.

NUCI, LA, a town of Naples, in the province of Bari; 12 miles S.W. of Monopoli.

NUCIFEROUS, an appellation given by botanists to trees which bear nuts.

NUCIFRAGA, in *Ornithology*, a name given by many to the *coccothraustes*, or gros-beak, from its breaking nuts and

the stones of fruits. See *LOXIA Coccothraustes*. See also *CORVUS Caryocatactes*.

NUCIPERSICA, in *Botany*. See AMYGDALUS.

NUCK, ANTHONY, in *Biography*, a distinguished Dutch physician and anatomist, flourished at the Hague, and subsequently at Leyden, in the latter part of the seventeenth century. He filled the office of professor of anatomy and surgery in the university of the latter place, and was also president of the College of Surgeons. He pursued his dissections with great ardour, cultivating both human and comparative anatomy at every opportunity. He died about the year 1692. He contributed some improvements also to the practice of surgery. The following is a catalogue of his publications. "De Vasis aquosis Oculi," Leid. 1685. "De Ductu salivari novo, Salivâ, ductibus aquosis et humore aqueo oculorum," ibid. 1686. Some subsequent editions of this work were entitled, "Sialographia, et ductuum aquorum Anatome nova." "Adenographia curiosa, et Uteri feminei Anatome nova, cum Epistola ad Amicum de Inventis novis," ibid. 1692, &c. "Operationes et Experimenta Chirurgica," ibid. 1692, and frequently reprinted. The three last mentioned works were published together, in three small volumes, at Lyons, in 1722. Eley Dict. Hist. de la Med.

NUCKIANÆ GLANDULÆ, in *Anatomy*, a number of small glands, situate in that part of the skull wherein the orbits of the eyes are, between the abducent muscle of the eye, and the upper part of the os jugale. See GLAND.

They were thus denominated from their discoverer, Anthony Nuck, professor of physic at Leyden.

The same author gave his name to a salival duct, *ductus Nuckianus*.

NUCLEUS, a Latin word, literally denoting the kernel of a nut, or stone fruit; or, more strictly, the edible part contained within the skin of the kernel.

NUCLEUS is also used by *Botanists*, in a larger sense, for any fruit or seed contained within a husk or shell.

NUCLEUS is also used by Hevelius, and some other astronomers, for the body of a comet, which others call its head, in contradistinction to its tail, or beard. See COMET.

NUCLEUS is also applied by some to the central parts of the earth, and other planets, as supposing them to be loose from the exterior part, which they consider as a cortex or shell.

NUCLEUS, in *Architecture*, denotes the middle part of the flooring of the ancients, consisting of a strong cement, over which they laid the pavement, bound with mortar.

NUDDEAH, in *Geography*, a town of Hindoostan, in Bengal; 30 miles E.N.E. of Burdwan.—Also, a town of Hindoostan, in Dooab; 24 miles S. of Canoge.

NUDDERE, a town of Hindoostan, in the circle of Ellichpour; 24 miles S.W. of Akoat.

NUDDYA, a town of Bengal; 31 miles N.W. of Burdwan.

NUDE COMPACT, *Nudum Pactum*, a bare contract, engagement, or promise of a thing without any consideration: *Ex quo*, say the lawyers, *non oritur actio*. See CONTRACT.

NUDE Matter denotes a bare allegation of a thing done.

NUDIPEDALIA, among the ancients, a festival in which all were obliged to walk bare-footed.

This was done on account of some public calamity, as the plague, famine, an intense drought, and the like.

It was likewise usual for the Roman matrons, when any supplication and vows were to be made to the goddess Vesta, to walk in procession to her temple bare-footed.

NUDITIES,

NUDITIES, in *Painting and Sculpture*, denote those parts of a human figure not covered with any drapery; or those parts where the carnations appear.

NUEL, or rather *Newel* of a staircase. See **NEWEL**, and **STAIR-CASE**.

NUESTRA SENIORA, in *Geography*, a town of South America, in the province of Cordova; five miles E. of Cordova.

NUESTRA Senhora de Ajuda, a town of Brazil; 150 miles S.W. of Fernambuco.

NUESTRA Senhora del Estero, a town of Brazil, capital of a government, on the coast opposite to the island of St. Catharine. S. lat. 28° 10'.

NUESTRA Senhora de Luz, an island in the Pacific ocean, discovered by Quiros in 1506; the same with that called "Pic de l'Etoile" by Bougainville. S. lat. 14° 30'.

NUESTRA Senhora de Pecos, a town of New Mexico; 10 miles E. of Santa Fé.

NUESTRA Senhora de Popa, a town of South America, in the province of Carthage; five miles N. of Carthage.

NUESTRA Senhora de la Fé, a town of South America, in the province of Cuyos. S. lat. 21°. W. long. 56° 46'.

—Also, a town of South America, in the province of Paraguay; 120 miles S.S.E. of Assumption.

NUESTRA Senhora de Nieves, a town of Brazil, on an island in the Amazon river, in which are an ancient mission and Spanish settlement. S. lat. 2° 30'. W. long. 49° 35'.

NUESTRA Senhora los Santos, a town of South America, in the province of Cordova; 42 miles E. of Cordova.

NUESTRA Senhora de Socoro, a town of New Mexico, on the Bravo; 115 miles S. of Santa Fé. See **CHONOS**.

NUESTRA Senhora de Vittoria, a town of Brazil, in the government of St. Salvador; eight miles N.W. of St. Jorge. See **TABASCO**.

NUESTRA Senhora de Talavera, a town of South America, in the province of Tucuman.

NUEZ, a town of Spain, in the province of Leon, on the borders of Portugal; 42 miles W. of Zamora.

NUFAR, in *Botany*. See **NUPHAR**.

NUGARAH, in *Geography*, a town of Hindoostan, in Allahabad; 27 miles N.E. of Gazpouir.

NUGENT, ROBERT, Earl, in *Biography*, an ingenious nobleman, was born of an ancient family in the county of Westmeath, in Ireland, in the year 1709. He was bred a Roman Catholic, which religious profession he abjured, and became a member of the British parliament in 1741. He was much attached to the cause of the prince of Wales, with whom he was a great favourite, and was appointed comptroller of the household of his royal highness. In 1754 he was made commissioner of the treasury, and in the parliament that met in the same year, he was chosen representative for the city of Bristol, and continued to sit for that place till 1774, when he was chosen for St. Mawes. In 1766 he was appointed one of the commissioners of trade and plantations, and at the same time created a peer by the title of baron Nugent and viscount Clare. He was afterwards raised to the rank of earl, and died in 1788. His lordship is known in the literary world by "A Collection of Odes and Epistles," which is said to possess great merit. He was author likewise of "An Ode to Mankind," published in 1741; "Verses addressed to the Queen, with a New Year's Gift of Irish Manufacture;" "Verses to the Memory of Lady Townshend," and other pieces.

NUGENT, THOMAS, an Irish writer, and doctor of laws, who died at London in the year 1772. He published "A Tour in Europe," in 4 vols.; "Translations of the Port Royal Latin and Greek Grammars;" "A Pocket

Dictionary of the French Language;" and "A Vocabulary of the Greek Primitives." Dr. Nugent, in the preface to the above named Latin grammar, says, that the author of that work, and of the other grammars, out of his great modesty, chose to conceal himself under the general name of the Society of Port Royal, but that his name was Claude Lancelot, who was born at Paris in 1613. Having finished his introductory studies he retired to Port Royal, and was employed in the education of youth. His various grammars were founded on his experience as a diligent instructor. He was afterwards selected by the prince of Conti to educate the young princes. Considerable preferment was within his reach and actually pressed upon him, but he chose to retire to the abbey of St. Cyran, and enter a monastic life. He died at the age of eighty, at the abbey of Quimperlè, in Brittany.

NUGGOORDER, in *Geography*, a town of Hindoostan, in Lahore; 30 miles E.S.E. of Sultanpour.

NUGHZ. See **NAGEZ**.

NUGOAH, a town of Hindoostan, in Bahar; 10 miles N.N.W. of Chuprah.

NUITS, a town of France, in the department of the Côté d'Or, and chief place of a canton, in the district of Beaune, celebrated for the excellent wines made in its vicinity; 12 miles S. of Dijon. The place contains 2541, and the canton 12,367 inhabitants, on a territory of 332½ kilometres, in 28 communes.

NUIZIA, a river of Russia, which runs into the Olckma. N. lat. 57° 15'. E. long. 119° 34'.

NUK, or **NUKOE**, an island of the Baltic, which occasionally becomes a peninsula, being joined to the main land; but when the water is high, and the wind blows from the sea, the flood so runs between, that it is entirely cut off from the land; though at times it is possible to walk dry-shod from one to the other. Nuk is about 14 versts long and eight broad.—Also, a lake in the government of Olonetz, about 40 miles long and six broad. N. lat. 64° 20' to 64° 40'. E. long. 31° to 32°.

NULDINGAH, a town of Bengal, capital of the circar of Mahmudfi; 65 miles N.E. of Calcutta. N. lat. 23° 27'. E. long. 89° 16'.

NULEZ, a small town of Spain, in the province of Valencia; 25 miles N.N.E. of Valencia. It is of a square form, surrounded with walls flanked with towers, and has four gates. The houses in narrow but straight streets exhibit a mean appearance. Its population amounts to about 3400 inhabitants.

NULHATTY, a town of Hindoostan, in Bengal; 25 miles W.N.W. of Moorshedabad. N. lat. 24° 17'. E. long. 87° 38'.

NULLACONDA, a town of Hindoostan, in Golconda; 40 miles S.E. of Hydrabad.

NULLITY, the quality of a thing null, that is void, and of no effect, by reason of something contrary to law, custom, or form.

There are two kinds of nullities to invalidate a contract, or other instrument, viz. *de facto* and *de jure*. The former where the thing commences null *ipso facto*, as soon as the thing is proved: in the latter the act does not immediately become null, but a handle is given thereby to have it entirely annulled, or set aside.

NULLUA, in *Geography*, a town of Bengal; 30 miles S. of Calcutta.

NULSHI, a town of Hindoostan, in Bengal; 20 miles N.N.W. of Pucculoe.

NUMA, POMPILIUS, in *Biography*, second king of Rome, a Sabine, the son of Pompilius Pompo, a person of illustrious

illustrious family. The Sabines at this time were distinguished for the simplicity and strictness of their manners; and Numa, whose mind was improved by the philosophy which he had imbibed in his youth, became himself eminent for wisdom and virtue. It has been thought by some writers, that he received instruction from Pythagoras the Samian philosopher; but there is good evidence to prove that this sage was posterior to Numa by a century. Such was the reputation of Numa, that Tatius, the Sabine associate of Romulus in his kingdom, bestowed upon him his daughter. At the death of Romulus, the Romans fixed upon him as their king, and two senators were deputed to acquaint him of the fact. Numa at first refused their offer, but was at length prevailed upon, with much difficulty, to accept the crown. He was not, like Romulus, fond of the arts and practice of war, but applied himself to tame the ferocity of his subjects, to inculcate a reverence for the Deity, and to quell their dissensions, by dividing all the citizens into different classes. He established different orders of priests, and encouraged the report which was spread of his paying regular visits to the nymph Egeria, making use of her name to give sanction to the laws and institutions which he had introduced. He impressed upon the Romans the idea that the safety of the empire depended on the preservation of the sacred shield, which, as was then generally believed, fell from heaven. He dedicated new temples, particularly that of Janus, which was to remain shut in time of peace, and to stand open in time of war. He made several laws for the reformation of manners; and promoted agriculture, by assigning portions of the conquered lands to those who had no other occupation. He endeavoured to break the distinction which subsisted, when he came to the crown, between the Romans and the Sabines, by distributing the citizens generally into companies, according to their several trades and occupations, thus uniting the individuals of the two nations by the subordinate ties of communities of interest and employment. Another reform he attempted, which appears not only wonderful, but almost beyond belief, had we not ample evidence as to the fact; this was the reformation of the calendar, the principle of which was the division of the year into twelve lunar months, which he made to correspond with the course of the sun by intercalations. Numa likewise marked out the boundaries of the Roman territories, which Romulus had declined doing; and, therefore, seemed to renounce the idea of future aggrandisement by the operation of warfare. His whole reign was wholly pacific; and had his successors been like himself, Rome would have been ranked only among the petty states of Italy; he may, however, be justly denominated one of the founders of the Roman greatness, from the stability which he conferred on the constitution by his civil and religious institutes. He died, after a reign of forty-three years, having arrived at the age of eighty-three. Previously to his death, he ordered his body to be interred in a stone coffin, contrary to the custom of the times, and his books of ceremonies, which consisted of twelve in Latin, and as many in Greek, to be buried by his side. These, it was said, were taken up about 400 years after; and, because it was thought impious to communicate the mysteries they contained to the common people, they were burnt by order of the senate. He left behind him one daughter, called Pompilia, who married Numa Marcius, and became the mother of Ancus Marcius, the fourth king of Rome. See *ANCUS*. Univer. Hist. Plutarch.

NUMAGA, in *Geography*, a river of Germany, which runs into the Rhine, 6 miles above Brifach.

NUMANTIA, in *Ancient Geography*, a town in the interior part of Hither Spain, at one of the sources of the

Durius. According to Strabo, it was the capital of Celtiberia. Strong both by nature and art, and by the number of its inhabitants, it was built upon a hill difficult of access, and on three sides surrounded by mountains; and its extent was such, that within its circuit they had pasture for their cattle. Numantia is celebrated in Roman history for the long war which it sustained against this republic, and for the ferocious bravery with which it defended itself at the close of a siege of twenty years. It was destroyed at length by Scipio Africanus in the year of Rome 620.

NUMB-Fish, a cramp-fish, in *Ichthyology*. See *TORPEDO*.

NUMBER is properly a collection or an assemblage of units, or of several things of the same sort. Some authors, however, give a more comprehensive definition of number, calling it that by which quantity of any kind is expressed, and hence include under the same general denomination *integers*, *fractions*, and *furds*.

Numbers are also divided into a variety of classes, according to the particular manner in which they are generated, or the forms under which they are included, or the properties which they possess. The principal of which divisions may be enumerated as follows:

An unit, or unity, is the representation of any thing considered individually, without regard to the parts of which it is composed.

An integer, or integral number, is an unit, or an assemblage of units.

An even number is that which can be divided into two equal integral parts.

An odd number is that which cannot be divided into two equal integral parts; being greater or less than some even number by unity.

A composite number is any number that is produced by the multiplication of two or more integral factors; or it is a number that may be divided into two or more equal integral parts, each greater than unity.

A prime number is that which cannot be produced by the multiplication of any integral factors; or it is that which cannot be divided into any number of equal integral parts greater than unity. See *PRIME Number*.

Commensurable numbers are such as have each the same common divisor; or that may be each exactly divided into the same number of equal integral parts.

Incommensurable numbers, or numbers prime to each other, are such as have not a common divisor.

Square numbers are those which arise from the product of two equal integral factors.

Cube numbers are those which arise from the product of three equal integral factors.

A power is that which arises from the multiplication of any number of equal factors, and it is called the 2d, 3d, 4th, &c. power, according as it consists of two, three, four, &c. factors. See *POWER*.

A perfect number is that which is equal to the sum of all its divisors, or aliquot parts; thus $6 = 1 + 2 + 3$;

or $6 = \frac{6}{2} + \frac{6}{3} + \frac{6}{6}$; therefore 6 is a *PERFECT*

Number; which see.

Abundant number is that which exceeds the sum of all its divisors, or aliquot parts.

Deficient number is that which is less than the sum of all its divisors, or aliquot parts.

Amicable numbers are those pairs of integers, each of which is equal to all the aliquot parts of the other: thus 284 and 220 are a pair of amicable numbers, for

NUMBERS.

$$\frac{284}{2} + \frac{284}{4} + \frac{284}{71} + \frac{284}{142} + \frac{284}{284} = 220;$$

$$\text{and } \frac{220}{2} + \frac{220}{5} + \frac{220}{10} + \frac{220}{11} + \frac{220}{22} + \frac{220}{20}$$

$$+ \frac{220}{44} + \frac{220}{55} + \frac{220}{110} + \frac{220}{220} = 284.$$

Figurate numbers are all those that fall under the general expression

$$\frac{n(n+1)(n+2)(n+3), \&c. \dots (n+m)}{1 \cdot 2 \cdot 3 \cdot 4, \&c. \dots (m+1)}$$

and they are said to be of the 1st, 2d, 3d, &c. order, according as $m = 1, 2, 3, \&c.$: thus,

Nat. series, 1, 2, 3, 4, 5, &c.	-	n
1st ord. 1, 3, 6, 10, 15, &c.	-	$\frac{n(n+1)}{1 \cdot 2}$
2d ord. 1, 4, 10, 20, 35, &c.	-	$\frac{n(n+1)(n+2)}{1 \cdot 2 \cdot 3}$
3d ord. 1, 5, 15, 35, 70, &c.	-	$\frac{n(n+1)(n+2)(n+3)}{1 \cdot 2 \cdot 3 \cdot 4}$
4th ord. 1, 6, 21, 56, &c. &c.	-	

These are otherwise called *pyramidal numbers*.

Polygonal numbers are the sums of different and independent arithmetical series, and are termed *natural* or *lineal*, *triangular*, *quadrangular* or *square*, *pentagonal*, *hexagonal*, &c. numbers, according to the series from which they are generated.

Lineal, or *natural numbers*, are formed from the successive sums of a series of units; thus,

Units,	-	1, 1, 1, 1, 1, 1, &c.
Nat. numbers,	-	1, 2, 3, 4, 5, 6, &c.

General form, n .

Triangular numbers are the successive sums of an arithmetical series, beginning with unity, the common difference of which is 1; thus,

Arith. series,	-	1, 2, 3, 4, 5, &c.
Triangular numbers,	-	1, 3, 6, 10, 15, &c.

General form, $\frac{n^2 - n}{2}$.

Quadrangular or *square numbers* are the successive sums of an arithmetical series, beginning with unity, the common difference of which is 2; thus:

Arithmetical series,	-	1, 3, 5, 7, 9, &c.
Quadrangular or square numbers,	-	1, 4, 9, 16, 25, &c.

General form, $\frac{2n^2 - 0n}{2} = n^2$.

Pentagonal numbers are the successive sums of an arithmetical series, beginning with unity, the common difference of which is 3; thus:

Arithmetical series,	-	1, 4, 7, 10, 13, &c.
Pentagonal numbers,	-	1, 5, 12, 22, 35, &c.

General form, $\frac{3n^2 - n}{2}$.

and so on for *hexagonal*, *heptagonal*, &c. numbers; the general form for the m -gonal series of numbers being

$$\frac{(m-2)n^2 - (m-4)n}{2}$$

These are called *polygonal numbers*, because they may be always arranged in the forms of the several geometrical figures, after which they are denominated. See *POLYGONAL Numbers*.

NUMBERS are farther divided into *absolute*, *abstract*, *concrete*, *discrete*, *heterogeneous*, *homogeneous*, *rational*, *irrational*, *furd*, &c.; for which, see the respective adjectives.

Theory of NUMBERS is a modern and very interesting branch of analysis, which is directed towards the investigation of the several properties, forms, divisors, products, &c. of integral numbers. This subject was indeed considered by some of the ancient mathematicians, viz. by Aristotle and Pythagoras, and particularly by Euclid and Diophantus; but in consequence of the embarrassing notation of those early times, and the total want of the algebraical analysis, but little progress was made in this branch of science till about the beginning of the 17th century, when Bachet, a French analyst of considerable reputation, undertook the translation of Diophantus into Latin, retaining also the Greek text, which was published by him in 1621, interspersed with many marginal notes of his own, and which may be considered as containing the first germ of our present theory. These were afterwards considerably extended by the celebrated Fermat, in his edition of the same work, published after his death in 1670, where we find many of the most elegant theorems in this branch of analysis; but they are generally left without demonstration, an omission which the author accounted for, by stating that he was himself preparing a treatise on the theory of numbers, which would contain "multa varia et abstrusissima numerorum mysteria;" but unfortunately this work never appeared, and most of his theorems remained without demonstration for a considerable time.

At length the subject was again revived by Euler, Waring, and La Grange, three of the most eminent analysts of modern times. The former, besides what is contained in his "Elements of Algebra," and his "Analysis Infinitorum," has several papers in the Petersburg Acts, in which are given the demonstrations of many of Fermat's theorems. What has been done by Waring on this subject is contained in chap. v. of his "Meditationes Algebraicae." And La Grange, who has greatly extended the theory of numbers, has several interesting papers on this head in the Memoirs of Berlin, besides what is contained in his Additions to Euler's Algebra. It is, however, but lately that this branch of analysis has been reduced into a regular system; a task that was first performed by Le Gendre, in his "Essai sur la Théorie des Nombres," Paris, 1800; a second edition of which was published in 1807: and nearly at the same time that the first edition appeared, Gauss published his "Disquisitiones Arithmeticae." These two works eminently display the talents of their respective authors, and contain a complete development of this interesting theory. The latter, in particular, has opened a new field of inquiry, by the application of the properties of numbers to the solution of binomial equations of the form, $x^n - 1 = 0$; on the solution of which depends the division of the circle into n equal parts, as was before known from the Cotesian theorem. (See *POLYGON*.) Mr. Barlow, of the Royal Military Academy, has also published a concise treatise on this subject, entitled "An elementary Investigation of the Theory of Numbers;" to which work we are indebted for many of the preceding remarks and definitions, as also for several of the following properties of numbers, in which we have generally omitted the demonstrations, as these would have carried us beyond the limits prescribed to the present article.

Properties

NUMBERS.

Properties of Numbers.

PROP. I.

On the Divisors of Numbers.—Every number N , when reduced to the form $N = a^m b^n c^p d^q$, &c. a, b, c , &c. being prime numbers, will have the number of the divisors expressed by the formula

$$(m+1)(n+1)(p+1)(q+1), \text{ \&c.};$$

the number itself being considered as one of its divisors.

Suppose, for example, it were required to find how many divisors belong to the number 360.

Here we have $360 = 2^3 \cdot 3^2 \cdot 5$; therefore $m = 3, n = 2, p = 1$. Hence, $(3+1)(2+1)(1+1) = 4 \cdot 3 \cdot 2 = 24$, the number of its divisors.

Again: required how many divisors belong to the number 1000.

First, $1000 = 2^3 \cdot 5^3$; therefore $m = 3$, and $n = 3$; whence $(3+1)(3+1) = 4 \cdot 4 = 16$, the number of divisors required, which are as follow: 1, 2, 4, 5, 8, 10, 20, 25, 40, 50, 100, 125, 200, 250, 500, 1000.

PROP. II.

To find a number that shall have any required number of divisors.

Let w represent the given number of divisors; resolve w into its factors, as $w = x \times y \times z$, &c. Then take $m = x - 1, n = y - 1, p = z - 1$, &c.; so shall $a^m b^n c^p$, &c. be the number required, where a, b, c , &c. may be taken any prime numbers at pleasure.

Exam.—Find a number that shall have 30 divisors.

First, $30 = 2 \times 3 \times 5$; that is, $x = 2, y = 3, z = 5$: therefore, $m = 1, n = 2, p = 4$; whence $a \cdot b^2 \cdot c^4$ is a number having 30 divisors, as required.

If $a = 2, b = 3, c = 5$; then $2 \cdot 3^2 \cdot 5^4 = 11250$.

If $a = 5, b = 3, c = 2$; then $5 \cdot 3^2 \cdot 2^4 = 720$.

If $a = 5, b = 2, c = 3$; then $5 \cdot 2^2 \cdot 3^4 = 1620$.

Each of which numbers has 30 divisors; and it is evident that various other numbers might be obtained, that would have the same property, by only changing the values of a, b, c , &c.

When it is required to find the least number that has a given number of divisors, we must resolve the given number into the greatest number of factors, and proceed in given values to a, b, c , &c. as follows, *viz.* to the greatest exponent the least root, the next greater exponent the next less root, &c.; the roots themselves being the least prime numbers that can be employed for this purpose, and which will of course depend upon the number of factors.

Suppose, for example, it were required to find the least number having 20 divisors.

Here the greatest number of factors is when we make $20 = 2 \times 2 \times 5$; or when $x = 2, y = 2$, and $z = 5$, and therefore $m = 1, n = 1$, and $p = 4$; so that $a^1 b^1 c^4$ is the least form; and by making $c = 2, b = 3, a = 5$, we have $2^4 \cdot 3^1 \cdot 5^1 = 240$, which is the least number that has 20 divisors.

PROP. III.

To find the sum of all the divisors of any given number.

Resolve the given number into the form $a^m \cdot b^n \cdot c^p$ &c. then the sum of all its divisors will be expressed by the formula

$$\frac{a^{m+1} - 1}{a - 1} \times \frac{b^{n+1} - 1}{b - 1} \times \frac{c^{p+1} - 1}{c - 1}, \text{ \&c.}$$

Suppose, for example, it were required to find the sum of all the divisors of 360, the number itself being included as one of them.

Here $360 = 2^3 \cdot 3^2 \cdot 5$; therefore $a = 2, b = 3, c = 5$; $m = 3, n = 2, p = 1$; whence,

$$\frac{2^4 - 1}{2 - 1} \times \frac{3^3 - 1}{3 - 1} \times \frac{5^2 - 1}{5 - 1} = 15 \cdot 13 \cdot 6 = 1170;$$

which is the sum of all the divisors of 360, the number itself being considered as one of them.

PROP. IV.

To find how many integers there are less than a given number N , and also prime to it.

Resolve the given number into the form $N = a^m b^n c^p$ &c. then will

$$N \times \frac{a-1}{a} \times \frac{b-1}{b} \times \frac{c-1}{c}, \text{ \&c.}$$

express the number of integers that are less than n , and also prime to N .

Exam.—How many numbers are there less than 100, which are also prime to it?

First, $100 = 2^2 \cdot 5^2$; therefore,

$$100 \times \frac{2-1}{2} \times \frac{5-1}{5} = 40,$$

the number sought, these being as follow, *viz.*

1	13	27	39	51	63	77	89
3	17	29	41	53	67	79	91
7	19	31	43	57	69	81	93
9	21	33	47	59	71	83	97
11	23	37	49	61	73	87	99

Exam. 2.—How many numbers are there less than 360, that are also prime to it?

Here $360 = 2^3 \cdot 3^2 \cdot 5$; therefore,

$$360 \times \frac{2-1}{2} \times \frac{3-1}{3} \times \frac{5-1}{5} = 96,$$

the number sought.

PROP. V.

A number that is the sum of two squares prime to each other, can only be divided by numbers that are also the sums of two squares; or, which is the same, every divisor of a number falling under the form $t^2 + u^2$, t and u being prime to each other, is itself also of the same form.

Thus, for example, $65 = 8^2 + 1^2$, can only be divided by 13 and 5, each of which is the sum of two squares; for $13 = 3^2 + 2^2$, and $5 = 2^2 + 1^2$.

Also, $50 = 7^2 + 1^2$ have for divisors,

$$2 = 1^2 + 1^2, 5 = 2^2 + 1^2 \\ 10 = 3^2 + 1^2, 25 = 4^2 + 3^2.$$

And the same for all other numbers falling under the above form, observing only that the two squares must be prime to each other.

PROP. VI.

A number that is the sum of a square and double a square, prime to each other, can only be divided by numbers that are also made up of the sum of a square and double a square. Or, which is the same, every divisor of a number falling under the form $t^2 + 2u^2$, t and u being prime to each other, is itself also of the same form.

Thus

NUMBERS.

Thus for example, $99 = 1^2 + 2 \cdot 7^2$, can only be divided by the following numbers, which are all of the same form; viz.

$$\begin{aligned} 3 &= 1^2 + 2 \cdot 1^2 \\ 9 &= 1^2 + 2 \cdot 2^2 \\ 11 &= 3^2 + 2 \cdot 1^2 \\ 33 &= 5^2 + 2 \cdot 2^2 \end{aligned}$$

and the same for all other numbers of the above form.

PROP. VII.

Every number which is equal to the difference of a square and double a square, prime to each other, can have for divisors only those numbers which are also equal to the difference of a square and double a square. Or, every divisor of numbers falling under the form $t^2 - 2u$, t and u being prime to each other, can only have for divisors numbers that are of the same form. Thus for example, $98 = 10^2 - 2 \cdot 1^2$, have the four following divisors, each of which is of the same form, viz.

$$\begin{aligned} 2 &= 2^2 - 2 \cdot 1^2 \\ 7 &= 3^2 - 2 \cdot 1^2 \\ 14 &= 4^2 - 2 \cdot 1^2 \\ 49 &= 9^2 - 2 \cdot 4^2 \end{aligned}$$

and the same for all other numbers of this form.

For the divisors of the powers of numbers, see POWERS.

Of the Product and Transformation of certain numerical Formulæ.

PROP. VIII.

The product of the sum, and difference of two integers, is equal to the difference of their squares. For

$$(x + y)(x - y) = x^2 - y^2.$$

PROP. IX.

The product of the sum of two squares by double a square, is also the sum of two squares. For

$$(x^2 + y^2) \times 2z^2 = (x + y)^2 \times z^2 + (x - y)^2 \times z^2.$$

Hence, if a number be the sum of two squares, its double is also the sum of two squares. Also, if a number N be the sum of two squares, then $2^n N$ will be also the sum of two squares.

Thus for example:

$$\begin{aligned} 5 &= 2^2 + 1^2; 5 \times 2 = 10 = 3^2 + 1^2; \\ 10 \times 2 &= 4^2 + 2^2; 20 \times 2 = 40 = 6^2 + 2^2; \&c. \end{aligned}$$

PROP. X.

The product arising from the sum of two squares by the sum of two squares, is also the sum of two squares. For

$$(x^2 + y^2)(x'^2 + y'^2) = \left\{ \begin{aligned} &(xx' + yy')^2 + (xy' - x'y)^2, \text{ or} \\ &(xx' - yy')^2 + (xy' + x'y)^2 \end{aligned} \right.$$

Hence also it appears, that the product may be divided into two squares two different ways. And if this product be again multiplied by another, which is the sum of two squares, the resulting product may be divided into two squares four different ways; and generally, if a number N be the product of n factors, each of which is the sum of two squares; then will N be the sum of two squares, and may be resolved into two squares 2^n different ways.

For example:
$$\begin{array}{r} 5 = 2^2 + 1^2 \\ 13 = 3^2 + 2^2 \end{array}$$

The product
$$65 = 8^2 + 1^2, \text{ or } 7^2 + 4^2$$

Again:

$$17 = 4^2 + 1$$

The product
$$\begin{aligned} \{ 1105 &= 32^2 + 9^2 = 33^2 + 4^2 \\ &= 31^2 + 12^2 = 24^2 + 23^2 \end{aligned}$$

And this resolution of the proposed product into square parts, is readily effected by the foregoing formulæ. For,

$$(8^2 + 1)(4^2 + 1) = \left\{ \begin{aligned} &(4 \cdot 8 + 1)^2 + (8 \cdot 1 - 4 \cdot 1)^2 \\ &(4 \cdot 8 - 1)^2 + (8 \cdot 1 + 4 \cdot 1)^2 \end{aligned} \right.$$

$$(7^2 + 4^2)(4^2 + 1) = \left\{ \begin{aligned} &(4 \cdot 7 + 1 \cdot 4)^2 + (4 \cdot 4 - 7 \cdot 1)^2 \\ &(4 \cdot 7 - 1 \cdot 4)^2 + (4 \cdot 4 + 7 \cdot 1)^2 \end{aligned} \right.$$

and in the same manner may any other product arising from factors of this form be resolved into its square parts.

PROP. XI.

The product of the sum of three squares by the sum of two squares, is the sum of four squares. For

$$\begin{aligned} &(x^2 + y^2 + z^2)(x'^2 + y'^2) = \\ &(xx' + yy' + zz')^2 + (xy' - yx')^2 + x'^2 z^2 + y'^2 z^2 \end{aligned}$$

which is evidently the sum of four squares.

For example:
$$\begin{array}{r} 14 = 3^2 + 2^2 + 1^2 \\ 5 = 2^2 + 1^2 \end{array}$$

The product
$$\begin{aligned} \{ 70 &= (3 \cdot 2 + 2 \cdot 1)^2 + (2 \cdot 2 - 3 \cdot 1)^2 \\ &+ 2^2 + 1^2 = 8^2 + 1^2 + 2^2 + 1^2 \end{aligned}$$

PROP. XII.

The product of the sum of four squares by the sum of two squares, is also the sum of four squares. For

$$\begin{aligned} &(w^2 + x^2 + y^2 + z^2)(x'^2 + y'^2) = \\ &(wx' + xy' + zy')^2 + (w^2 x'^2 + y'^2 z^2) \end{aligned}$$

each of which products is the sum of two squares, by the 10th proposition above, and, consequently, the whole product is the sum of four squares.

PROP. XIII.

The product of the sum of four squares by the sum of four squares, is also the sum of four squares. For

$$\begin{aligned} &(w^2 + x^2 + y^2 + z^2)(w'^2 + x'^2 + y'^2 + z'^2) \\ &= \left\{ \begin{aligned} &(ww' + xx' + yy' + zz')^2 + (wx' - xw' + yz' - zy')^2 \\ &+ (wy' - yw' - xz' + zx')^2 + (wz' - zw' - xy' + yx')^2 \end{aligned} \right. \end{aligned}$$

as will appear immediately from the development of the above formulæ; and, consequently, the product in question is the sum of four squares.

As in this product there are only complete squares enter, we may change at pleasure the signs of the simple quantities; and, consequently, there will result several different formulæ equal to the same product, and each equal to the sum of four squares; and in so many ways may numbers arising from factors of the above form be resolved into the sum of four squares. La Grange has rendered this proposition more general by the following enunciation.

The product of the two formulæ

$$(w^2 - bx^2 - cy^2 + bcz^2)(w'^2 - bx'^2 - cy'^2 + bcz'^2)$$

$$\begin{aligned} &= \left\{ \begin{aligned} &(ww' + bx'x' \pm cy'y' \pm bcz'z')^2 - \\ &b(wx' + w'x \pm cy'z' \pm cz'y')^2 - \\ &c(wy' - bx'z' \pm yw' \pm bzx')^2 + \\ &bc(xy' - wz' \pm zw' \pm yx')^2 \end{aligned} \right. \end{aligned}$$

which equality will appear from the development of the formulæ.

PROP.

PROP. XIV.

The product of the two formulæ $(x^2 \pm a y^2)$, and $(x'^2 \pm a y'^2)$, is of the same form as each of them. For,

$$(x^2 \pm a y^2) (x'^2 \pm a y'^2) = \begin{cases} (x x' + a y y')^2 \pm a (x y' + y x')^2, \text{ or,} \\ (x x' - a y y')^2 \pm a (x y' - y x')^2 \end{cases}$$

and, consequently, the product of any number of factors of the form $(x^2 \pm a y^2)$ will be itself also of the same form.

PROP. XV.

The two formulæ $(x^2 + y^2 + z^2)$, and $(x^2 + y^2 + 2 z^2)$, are so related to each other, that the double of either produces the other. For

$$2(x^2 + y^2 + z^2) = 2x^2 + 2y^2 + 2z^2 = (x+y)^2 + (x-y)^2 + 2z^2$$

which is evidently of the latter form. And,

$$2(x^2 + y^2 + 2z^2) = 2x^2 + 2y^2 + 4z^2 = (x+y)^2 + (x-y)^2 + 4z^2$$

which is also obviously of the same form as the first.

For example: $14 = 3^2 + 2^2 + 1^2$

The product $\begin{cases} = 28 = (3+2)^2 + (3-2)^2 + 2 \cdot 1^2 \\ = 5^2 + 1^2 + 2 \cdot 1^2 \end{cases}$

Again: $15 = 3^2 + 2^2 + 2 \cdot 1^2$

The product $\begin{cases} = 30 = (3+2)^2 + (3-2)^2 + 2^2 \\ = 5^2 + 1^2 + 2^2 \end{cases}$

That is, each of these forms, when doubled, produces the other.

PROP. XVI.

The formula $x^2 - 2 y'^2$ may be always transformed to another of the form $2 x'^2 - y'^2$, and this last may be again converted into the former.

This is obvious, because

$$x^2 - 2 y'^2 = 2(x \pm y')^2 - (x \pm 2 y')^2, \text{ and} \\ 2 x'^2 - y'^2 = (x \pm 2 y')^2 - 2(x \pm y')^2$$

as will appear from the developement of the formulæ; and, consequently, any number that is of one of these forms is also of the other.

For example: $14 = 2 \cdot 3^2 - 2^2 = 4^2 - 2 \cdot 1^2$

Also, $28 = 6^2 - 2 \cdot 2^2 = 2 \cdot 4^2 - 2^2$

The same transformation has place with regard to numbers of the form $x^2 - 5 y^2$; for

$$x^2 - 5 y^2 = 5(x \pm 2 y)^2 - (2x \pm 5 y)^2, \text{ and} \\ 5 x^2 - y^2 = (5x \pm 2 y)^2 - 5(2x \pm y)^2$$

Thus, in the following numbers

$$29 = 7^2 - 5 \cdot 2^2 = 5 \cdot 11^2 - 24^2 = 5 \cdot 3^2 - 4^2$$

$$41 = 5 \cdot 3^2 - 2^2 = 19^2 - 5 \cdot 8^2 = 11^2 - 5 \cdot 4^2$$

which transformation is frequently extremely useful in the solution of Diophantine problems.

PROP. XVII.

If a be any number of the form $b^2 + 1$, then will the formula $x^2 - a y^2$ be resolvable into another of the form

$a x^2 - y^2$; and, conversely, this last may be transformed into the former. For,

$$x^2 - (b^2 + 1) y^2 = (b^2 + 1) (x \pm b y)^2 - (b x \pm (b^2 + 1) y)^2 \\ \text{And} \\ (b^2 + 1) x^2 - y^2 = ((b^2 + 1) x \pm b y)^2 - (b^2 + 1) (b x + y)^2$$

These general formulæ furnish us with the following particular ones:

$$\begin{cases} x^2 - 2 y^2 = 2 x'^2 - y'^2 \\ 2 x^2 - y^2 = x'^2 - 2 y'^2 \end{cases}$$

$$\begin{cases} x^2 - 5 y^2 = 5 x'^2 - y'^2 \\ 5 x^2 - y^2 = x'^2 - 5 y'^2 \end{cases}$$

$$\begin{cases} x^2 - 10 y^2 = 10 x'^2 - y'^2 \\ 10 x^2 - y^2 = x'^2 - 10 y'^2 \end{cases}$$

$$\begin{cases} x^2 - 17 y^2 = 17 x'^2 - y'^2 \\ 17 x^2 - y^2 = x'^2 - 17 y'^2 \end{cases}$$

&c. &c.

PROP. XVIII.

If m and n be the roots of the quadratic equation $\phi^2 - a \phi + b = 0$, then will the product of the two formulæ $(x + m y)$ and $(x + n y)$ be equal to $x^2 + 2 a x y + b y^2$.

This is evident from the actual multiplication of the factors $(x + m y)$, and $(x + n y)$. For

$$(x + m) + (x + n y) = x^2 + (n + m) x y + m n y^2$$

And since m and n are the two roots of the equation $\phi^2 - a \phi + b = 0$, we have, from the nature of equations, $m + n = a$, and $m n = b$; and, consequently, the product becomes $x^2 + a x y + b y^2$.

Hence, conversely, every quantity of the form $x^2 + a x y + b y^2$, may be considered as the product arising from the multiplication of two factors $(x + m y)$ and $(x + n y)$, m and n being the roots of the quadratic equation $\phi^2 - a \phi + b = 0$.

Or, which is the same, m and n being such as to answer the conditions $m + n = a$, $m n = b$.

PROP. XIX.

The product arising from the multiplication of the two formulæ $x^2 + a x y + b y^2$, and $x'^2 + a x' y' + b y'^2$, is itself also of the same form.

For, by the last,

$$x^2 + a x y + b y^2 = (x + m y) (x + n y) \\ x'^2 + a x' y' + b y'^2 = (x' + m y') (x' + n y')$$

therefore the product in question is the same as the continued product of the four latter factors. Now,

$$(x + m y) (x' + m y') = x x' + m (x y' + x' y) + m^2 y y'$$

And since $m^2 - a m + b = 0$, we have $m^2 = a m - b$, whence the above formula becomes

$$x x' - b y y' + m (x y' + x' y + a y y')$$

Or writing $X = x x' - b y y'$

$$Y = x y' + x' y + a y y'$$

we have $(x + m y) (x' + m y') = X + m Y$

so also, $(x + n y) (x' + n y') = X + n Y$

Consequently, the whole of the above product is

$$= (X + m Y) (X + n Y) = X^2 + a X Y + b Y^2$$

That

That is, the product of the two formulæ

$$(x^2 + axy + by^2) \text{ and } (x'^2 + ax'y' + by'^2)$$

is itself also of the same form; and, consequently, when $x = x'$, and $y = y'$, we have

$$(x^2 + axy + by^2)^2 = X^2 + aXY + bY^2$$

Hence we have a ready way of making a square of any such formulæ as $X^2 + aXY + bY^2$, or of $r^2 + ars + bs^2$; which is done by simply writing

$$r = x^2 - by^2 \\ s = 2xy + ay^2$$

in which expressions x and y may be assumed any integer numbers at pleasure.

Exam. 1.—Find the values of x and y in the equation

$$x^2 + 3xy + 5y^2 = z^2$$

Here $a = 3$, and $b = 5$; therefore the general values of x and y are

$$\begin{cases} x = t^2 - 5u^2 \\ y = 2tu + 3u^2 \end{cases}$$

where, for distinction sake, we write t and u , in the above formulæ, instead of x and y .

Whence, by assuming successively

$$t = 3, 4, 5, 6, \&c. \\ u = 1, 1, 1, 1, \&c.$$

we shall have the following corresponding values of x and y :

$$x = 4, 11, 20, 31, \&c. \\ y = 9, 11, 13, 15, \&c.$$

Exam. 2.—Find the values of x and y in the equation

$$x^2 - 7xy + 3y^2 = z^2$$

Here, since $a = -7$, and $b = 3$; the general values of x and y are

$$\begin{cases} x = t^2 - 3u^2 \\ y = 2tu - 7u^2 \end{cases}$$

And making now

$$t = 4, 5, 6, 7, 8, \&c. \\ u = 1, 1, 1, 1, 1, \&c.$$

we obtain,

$$x = 13, 22, 33, 46, 61, \&c. \\ y = 1, 3, 5, 7, 9, \&c.$$

Each of which corresponding values of x and y answer the required conditions of the equation; and it is manifest that an infinite number of other values might be obtained by changing those of t and u . Barlow's Theory of Numbers.

On the Partition of Numbers.

PROP. XX.

To find in how many different ways any proposed number may be divided into a given number of unequal parts.

$$\begin{aligned} &1 + x(x + x^2 + x^3 + x^4 + x^5 + x^6 + x^7 + x^8 + x^9 + \&c.) \\ &+ x^2(x^3 + x^4 + 2x^5 + 2x^6 + 3x^7 + 3x^8 + 4x^9 + 4x^{10} + 5x^{11} + \&c.) \\ &+ x^3(x^6 + x^7 + 2x^8 + 3x^9 + 4x^{10} + 5x^{11} + 7x^{12} + 8x^{13} + 10x^{14} + \&c.) \\ &+ x^4(x^{10} + x^{11} + 2x^{12} + 3x^{13} + 5x^{14} + 6x^{15} + 9x^{16} + 11x^{17} + 15x^{18} + \&c.) \\ &+ x^5(x^{15} + x^{16} + 2x^{17} + 3x^{18} + 5x^{19} + 7x^{20} + 10x^{21} + 13x^{22} + 18x^{23} + \&c.) \\ &+ x^6(x^{21} + x^{22} + 2x^{23} + 3x^{24} + 5x^{25} + 7x^{26} + 11x^{27} + 14x^{28} + 20x^{29} + \&c.) \\ &+ x^7(x^{28} + x^{29} + 2x^{30} + 3x^{31} + 5x^{32} + 7x^{33} + 11x^{34} + 15x^{35} + 21x^{36} + \&c.) \\ &+ x^8(x^{36} + x^{37} + 2x^{38} + 3x^{39} + 5x^{40} + 7x^{41} + 11x^{42} + 15x^{43} + 22x^{44} + \&c.) \end{aligned}$$

Let us propose the following expression, viz.

$$(1 + x^a z) \cdot (1 + x^b z) \cdot (1 + x^c z) \cdot (1 + x^d z) \cdot (1 + x^e z) \&c.$$

and endeavour to ascertain the form that it takes when expanded by multiplication. And, first, let us suppose it to become

$$1 + Pz + Qz^2 + Rz^3 + Sz^4, \&c.$$

then it is evident, from the theory of equations, that P will be the sum of the powers

$$x^a + x^b + x^c + x^d + x^e, \&c.$$

and Q , the sum of the products, of all the possible combinations of these powers taken two and two; or an assemblage of the several powers of x , of which the exponents are the sums of two different terms of the series

$$a, b, c, d, e, f, \&c.$$

On the same principle, R will be an assemblage of the powers of x , of which the exponents are the sums of three different terms of the same series; S will be an assemblage of all the powers of x , of which the exponents are the sums of four different terms of the same series; and so on.

Now, it is manifest, that the powers of x , which are comprised in the values of $P, Q, R, S, \&c.$ will have unity for their co-efficients; if their exponents can only be formed in one way, by the quantities $a, b, c, d, e, \&c.$; but if the exponent can be formed in many ways, by the sums of two, three, or more, terms of the same series; then will this power have a co-efficient, that contains unity as many times. For example, if Nx^n be found in the value of Q , this will be a proof that n may be formed in N different ways from the sums of two different terms of the series $a, b, c, d, e, f, \&c.$; and if we find in the development of the proposed factors the term $Nx^n z^n$, its co-efficient N , indicates, in how many different ways the number n may be the sum of m , different terms of the series

$$a, b, c, d, e, f, \&c.,$$

Thus, the proposed product,

$$(1 + x^a z) \cdot (1 + x^b z) \cdot (1 + x^c z) \cdot (1 + x^d z) \cdot (1 + x^e z) \&c.$$

being really developed by multiplication, the result will shew immediately in how many different manners a given number may be the sum of any proposed number of different terms of the series $a, b, c, d, \&c.$: for example, if one wished to know in how many different ways the number n may be formed of m different terms of this series, we must ascertain the term $x^n z^m$ in the expanded expression, and the co-efficient of this term will be the number required.

In order to render this the more evident, let us take this product, composed of an infinite number of factors,

$$(1 + xz) \cdot (1 + x^2 z) \cdot (1 + x^3 z) \cdot (1 + x^4 z) \cdot (1 + x^5 z) \&c.$$

the real multiplication of which gives

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And by means of this series we may ascertain at once in how many different ways a proposed number may be formed of any determined number of terms of the series

$$1, 2, 3, 4, 5, 6, 7, 8, \&c.$$

Suppose, for example, it were required to find in how many different ways the number 35 may be the sum of seven different terms of the series

$$1, 2, 3, 4, 5, 6, 7, 8, \&c.$$

Find in the series, that has the multiplier z^7 , the power x^{35} ; and its co-efficient, 15, indicates that the number 35 may be formed fifteen different ways, by the sums of seven terms of the above series.

But if we take $z = 1$, and thus unite together all the equal powers of x , or, which is the same thing, if we develop by multiplication the following infinite product,

$$(1+x) \cdot (1+x^2) \cdot (1+x^3) \cdot (1+x^4) \cdot (1+x^5) \cdot (1+x^6) \&c.$$

we shall have the series,

$$1 + x + x^2 + 2x^3 + 2x^4 + 3x^5 + 4x^6 + 5x^7 + 6x^8 + \&c.$$

in which each co-efficient indicates in how many different ways the exponent of the corresponding power of x may result from the addition of different terms of the series 1, 2, 3, 4, 5, 6, 7, &c. without regard to the number of them.

Thus it appears, that there are six different manners of forming the number 8, by the addition of different numbers; as follows:

$$\begin{aligned} 8 &= 8 \\ 8 &= 7 + 1 \\ 8 &= 6 + 2 \\ 8 &= 5 + 3 \\ 8 &= 5 + 2 + 1 \\ 8 &= 4 + 3 + 1 \end{aligned}$$

It should be observed here, that we must include the number itself, as one way of forming it; because, the number of terms to be selected in the above series being indeterminate, it necessarily follows, that we may consider a single term as one of the selections.

Cor. — From what has been said, we learn how many ways a number may be produced by the addition of different numbers. But this condition, which requires different numbers, will no longer have place, if we transpose these factors to the denominator. Let us therefore consider this case.

$$\begin{aligned} &1 + z(x + x^2 + x^3 + x^4 + x^5 + x^6 + x^7 + x^8 + x^9 + \&c.) \\ &+ z^2(x^2 + x^3 + 2x^4 + 2x^5 + 3x^6 + 3x^7 + 4x^8 + 4x^9 + 5x^{10} + \&c.) \\ &+ z^3(x^3 + x^4 + 2x^5 + 3x^6 + 4x^7 + 5x^8 + 7x^9 + 8x^{10} + 10x^{11} + \&c.) \\ &+ z^4(x^4 + x^5 + 2x^6 + 3x^7 + 5x^8 + 6x^9 + 9x^{10} + 11x^{11} + 15x^{12} + \&c.) \\ &+ z^5(x^5 + x^6 + 2x^7 + 3x^8 + 5x^9 + 7x^{10} + 10x^{11} + 13x^{12} + 18x^{13} + \&c.) \\ &+ z^6(x^6 + x^7 + 2x^8 + 3x^9 + 5x^{10} + 7x^{11} + 11x^{12} + 14x^{13} + 20x^{14} + \&c.) \\ &+ z^7(x^7 + x^8 + 2x^9 + 3x^{10} + 5x^{11} + 7x^{12} + 11x^{13} + 15x^{14} + 21x^{15} + \&c.) \\ &+ z^8(x^8 + x^9 + 2x^{10} + 3x^{11} + 5x^{12} + 7x^{13} + 11x^{14} + 15x^{15} + 22x^{16} + \&c.) \end{aligned}$$

We may, therefore, by means of this series, find immediately in how many different manners a number may be formed by the addition of any proposed number of terms of this series, 1, 2, 3, 4, 5, 6, 7, &c. Suppose, for example, it were required to know in how many different ways the number 13 might be made the sum of five integers. We must, in this case, look for the term $x^{13}z^5$, and the co-efficient of which, 18, shews us, that the number in question, 13, may be eighteen different ways formed by the addition of five integer numbers.

PROP. XXI.

To find in how many different ways any given number may be divided into a proposed number of equal or unequal integral parts.

Let there be proposed this expression,

$$\frac{1}{(1-x^az) \cdot (1-x^bz) \cdot (1-x^cz) \cdot (1-x^dz) \cdot (1-x^ez)}$$

which, being developed by division, gives the series

$$1 + Pz + Qz^2 + Rz^3 + Sz^4 + \&c.$$

and from the first principles of algebra, it is evident that P is the sum of all the powers of x , of which the exponents are contained in the series

$$a, b, c, d, e, f, \&c. \cdot$$

Also, Q will be an assemblage of the powers of x , of which the exponents are the sums of two terms of the same series, repeated or not. Likewise, R will be the sums of the powers of x , of which the exponents are formed by the addition of three terms; and S the sum of the powers, of which the exponents are formed by the addition of four terms, comprised in this series, and so on of the other co-efficients.

Consequently, if we suppose that the expressions have been actually developed, and that we have collected together the similar terms, we shall see in how many different ways a proposed number, n , may be formed by the addition of m terms, different or not, of the series $a, b, c, d, e, f, \&c.$

Let us seek, for example, in the developed expression, the term $x^n z^m$, and its co-efficient, which we will suppose N; in short that the whole term will be $= Nx^n z^m$; then will the co-efficient, N, shew in how many different ways the number n may be formed by the addition of m terms contained in the series $a, b, c, d, e, f, \&c.$ And hence we shall have the solution of a question, analogous to the former one which we have been considering, except that in this they are not necessarily different terms, which was a condition in the first problem.

Let us apply what has been said to a particular case, taking this expression,

$$\frac{1}{(1-xz) \cdot (1-x^2z) \cdot (1-x^3z) \cdot (1-x^4z) \cdot (1-x^5z)} \&c.$$

the actual development of which, by division, gives

$$\begin{aligned} &1 + x + 2x^2 + 3x^3 + 5x^4 + 7x^5 + 11x^6 + 15x^7 + 22x^8 + \&c. \\ &\text{in which each co-efficient indicates in how many different} \\ &\text{ways the exponents of the corresponding power can be} \\ &\text{formed by the addition of integers, without regard to the} \\ &\text{number of them, or whether they be equal or unequal.} \end{aligned}$$

For example, the term $11x^6$ shews that the number 6 may

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may be produced eleven different ways, by the addition of whole numbers, as follows :

$$\begin{aligned} 6 &= 6 \\ 6 &= 5 + 1 \\ 6 &= 4 + 2 \\ 6 &= 4 + 1 + 1 \\ 6 &= 3 + 3 \\ 6 &= 3 + 2 + 1 \\ 6 &= 3 + 1 + 1 + 1 \\ 6 &= 2 + 2 + 2 \\ 6 &= 2 + 2 + 1 + 1 \\ 6 &= 2 + 1 + 1 + 1 + 1 \\ 6 &= 1 + 1 + 1 + 1 + 1 + 1. \end{aligned}$$

Here we may remark also, that the proposed number, being contained in the series of numbers 1, 2, 3, 4, 5, 6, &c. is itself one way of forming it.

PROP. XXII.

To find, independently of the developement by multiplication, the series of the powers x , that were deduced by that method in Prop. XX.

Let there be proposed, to this effect, the following expression :

$$Z = (1 + xz) \cdot (1 + x^2z) + (1 + x^3z) \cdot (1 + x^4z) \cdot (1 + x^5z) + \&c.;$$

which being developed by multiplication, and arranged according to the powers of z , gives this series :

$$Z = 1 + Pz + Qz^2 + Rz^3 + Sz^4 + Tz^5 + \&c.;$$

and it is here required to find an expeditious method of obtaining the functions P , Q , R , S , &c. of x ; for we shall have, by this means, the solution of the question proposed.

Now it is evident, that if we write xz for z , we shall have

$$(1 + x^2z) \cdot (1 + x^3z) \cdot (1 + x^4z) \cdot (1 + x^5z) \&c. = \frac{z}{1 + xz}.$$

Therefore, in substituting xz for z , the value of the product, which was z , is changed into $\frac{z}{1 + xz}$; and, consequently, since

$$Z = 1 + Pz + Qz^2 + Rz^3 + Sz^4 + \&c.;$$

we shall have

$$\frac{z}{1 + xz} = 1 + Pxz + Qx^2z^2 + Rx^3z^3 + Sx^4z^4 + \&c.$$

Multiplying of which by $1 + xz$, we shall obtain

$$Z = 1 + Pxz + Qx^2z^2 + Rx^3z^3 + Sx^4z^4 + \&c. + xz + Px^2z^2 + Qx^3z^3 + Rx^4z^4 + \&c.$$

And this value of z , compared with the former, will give

$$P = \frac{x}{1 - x}, Q = \frac{Px^2}{1 - x^2}, R = \frac{Qx^3}{1 - x^3}, S = \frac{Rx^4}{1 - x^4}, \&c.$$

We shall have, therefore, for P , Q , R , S , &c. the following values :

$$P = \frac{x}{1 - x};$$

$$Q = \frac{x^3}{(1 - x) \cdot (1 - x^2)};$$

$$R = \frac{x^6}{(1 - x) \cdot (1 - x^2) \cdot (1 - x^3)};$$

$$S = \frac{x^9}{(1 - x) \cdot (1 - x^2) \cdot (1 - x^3) \cdot (1 - x^4)};$$

$$T = \frac{x^{15}}{(1 - x) \cdot (1 - x^2) \cdot (1 - x^3) \cdot (1 - x^4) \cdot (1 - x^5)};$$

&c. &c. &c.

We may, therefore, obtain separately each of the series of the powers of x , and which will shew in how many different ways a proposed number may be formed, by the addition of any given number of integers : and it is evident that these, when converted by division, will be recurring series, because they result from a fractional function of x .

Thus, the first expression, $P = \frac{x}{1 - x}$, gives the geometrical progression

$$x + x^2 + x^3 + x^4 + x^5 + x^6 + x^7 + \&c.;$$

which indicates that every number is contained once in the series of integers 1, 2, 3, 4, &c. as is otherwise evident from first principles.

The second expression, $\frac{x^3}{(1 - x) \cdot (1 - x^2)}$, gives the series

$$x^3 + x^4 + 2x^5 + 2x^6 + 3x^7 + 3x^8 + 4x^9 + 4x^{10} + \&c.;$$

in which the co-efficient of each term shews in how many ways the exponent x may be parted into two unequal parts. For example, the term $4x^9$ shews that the number 9 may be separated, in four different ways, into two unequal parts. If we divide this series by x^3 , we shall have that which is

derived from the fraction $\frac{1}{(1 - x) \cdot (1 - x^2)}$, as follows :

$$1 + x + 2x^2 + 2x^3 + 3x^4 + 3x^5 + 4x^6 + 4x^7 + \&c.;$$

of which we will suppose the general term $= Nx^n$. Now, from the generation of this series, we know that the co-efficient N indicates in how many different ways the exponent n may be formed by the addition of the numbers 1 and 2; and since the general term of the first series is Nx^{n+1} , we may thence draw this

THEOREM.

Any number, $n + 3$, may be separated into two unequal parts, in as many ways as the number n may be formed by the addition of the numbers 1 and 2.

The third expression, $\frac{x^6}{(1 - x) \cdot (1 - x^2) \cdot (1 - x^3)}$, being reduced into a series, will give

$$x^6 + x^7 + 2x^8 + 3x^9 + 4x^{10} + 5x^{11} + 7x^{12} + 8x^{13} + \&c.$$

And the co-efficient of each term, in this series, shews in how many different ways the exponent of the corresponding power of x may be separated into three unequal parts. But the developement of the fraction,

$\frac{1}{(1 - x) \cdot (1 - x^2) \cdot (1 - x^3)}$, gives the series

$$1 + x + 2x^2 + 3x^3 + 4x^4 + 5x^5 + 7x^6 + 8x^7 + \&c.;$$

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of

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of which, if we suppose Nx^n to represent the general term, the co-efficient N will indicate in how many different ways the number n may be formed, by the addition of the three numbers 1, 2, and 3; and the general term of the foregoing series being Nx^{n+6} , we hence draw the following theorems.

THEOREM II.

Any number, $n + 6$, may be divided into three unequal parts, in as many ways as the number n may be formed by the addition of the three numbers 1, 2, and 3.

The fourth expression, $\frac{x^{10}}{(1-x) \cdot (1-x^2) \cdot (1-x^3) \cdot (1-x^4)}$,

when developed in a series, gives

$$x^{10} + x^{11} + 2x^{12} + 3x^{13} + 5x^{14} + 6x^{15} + 9x^{16} + 11x^{17} + \&c.$$

where the co-efficient of each term indicates in how many different ways the exponent of the corresponding power may be separated into four unequal parts; but the transformation of the expression $\frac{1}{(1-x) \cdot (1-x^2) \cdot (1-x^3) \cdot (1-x^4)}$ into a series, or the division of the one above by x^{10} , produces

$$1 + x + 2x^2 + 3x^3 + 5x^4 + 6x^5 + 9x^6 + 11x^7 + \&c.;$$

of which, supposing the general term to be Nx^n , it follows, that the co-efficient N shews in how many different ways the number n may be formed by the addition of the four numbers 1, 2, 3, 4; and hence, again, we deduce the following

THEOREM III.

Any number, $n + 10$, may be divided into four unequal parts, in as many ways as the number n may be formed by the addition of the four numbers 1, 2, 3, and 4.

In general, therefore, if the expression

$$\frac{1}{(1-x) \cdot (1-x^2) \cdot (1-x^3) \cdot \&c. (1-x^m)} \text{ be converted into a series, and of which we take } Nx^n \text{ to represent}$$

the general term; the co-efficient N will always indicate in how many different ways the number n may be formed by the addition of the numbers 1, 2, 3, 4, &c. m .

But if the expression

$$\frac{x^{\frac{m \cdot m + 1}{2}}}{(1-x) \cdot (1-x^2) \cdot (1-x^3) \cdot (1-x^4) \&c. (1-x^m)}$$

be converted into a series, the general term will be $Nx^{n+\frac{m \cdot m + 1}{2}}$; and of which the co-efficient N shews in how

many ways the number $n + \frac{m \cdot m + 1}{2}$ may be divided into

m unequal parts; and hence we draw the following general

THEOREM IV.

Any number, $n + \frac{m \cdot m + 1}{2}$, may be divided into m un-

equal parts, in as many ways as the number n may be formed by the addition of the numbers 1, 2, 3, 4, &c. m .

Having thus explained the law for the partition of numbers into unequal parts, we shall proceed to the investigation

of the proposition, which includes both equal and unequal parts.

PROP. XXIII.

To ascertain, independently of the developement by division, the series of the powers that were deduced by this method in Prop. XXII.

To this effect, let there be proposed the expression

$$Z = \frac{1}{(1-xz) \cdot (1-x^2z) \cdot (1-x^3z) \cdot (1-x^4z) \cdot (1-x^5z)}$$

and suppose that, from actual division, it becomes

$$Z = 1 + Pz + Qz^2 + Rz^3 + Sz^4 + Tz^5 + \&c.$$

and here, it is evident, that if we put xz , instead of z , in the above fraction, we shall have

$$(1-xz)Z = \frac{1}{(1-x^2z) \cdot (1-x^3z) \cdot (1-x^4z) \cdot (1-x^5z) \&c.}$$

and the same substitution having been made in the foregoing series, there will result

$$(1-xz)Z = 1 + Pxz + Qx^2z^2 + Rx^3z^3 + Sx^4z^4 + \&c.$$

Now, multiplying the first series by $(1-xz)$, we shall have

$$(1-xz)Z = 1 + Pz + Qz^2 + Rz^3 + Sz^4 + \&c. \\ -xz - Px^2z^2 + Qx^3z^3 + Rx^4z^4 + \&c.$$

And hence by comparison, we have

$$P = \frac{x}{1-x}, Q = \frac{Px}{1-x^2}, R = \frac{Qx}{1-x^3}, S = \frac{Rx}{1-x^4}, \&c.$$

which gives for P, Q, R, S , &c. the following independent values; viz.

$$P = \frac{x}{1-x};$$

$$Q = \frac{x^2}{(1-x) \cdot (1-x^2)};$$

$$R = \frac{x^3}{(1-x) \cdot (1-x^2) \cdot (1-x^3)};$$

$$S = \frac{x^4}{(1-x) \cdot (1-x^2) \cdot (1-x^3) \cdot (1-x^4)}.$$

These expressions differ from those found in the foregoing proposition, only in this; that the numerators in these have less exponents than those in the preceding case; and, consequently, the series that arise from the developement of these and the foregoing will perfectly agree with respect to their co-efficients, as is otherwise evident from a comparison of the two sets of series, which we have deduced at Prop. XXI. and Prop. XXII. And hence, without a repetition of the process, we may deduce the following theorems, analogous to those derived from Prop. XXIII.

THEOREMS.

1. *Any number, $n + 2$, may be divided into two parts, in as many different ways as the number n may be formed by the addition of the numbers 1 and 2.*

2. *Any number, $n + 3$, may be divided into three parts, in as many different ways as the number n can be formed by the addition of the numbers 1, 2, 3.*

3. *Any number, $n + 4$, may be divided into four parts, in as many different ways as the number n may be formed by the addition of the numbers 1, 2, 3, 4.*

4. *And,*

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4. And, generally, as many different ways as there are of forming the number n by the addition of the numbers 1, 2, 3, 4, . . . m ; so many different ways may the number $n + m$ be divided into m parts.

Having, therefore, to find in how many ways a given number may be divided into m unequal parts; and how many ways it may be divided into parts equal, or unequal; these two questions will be resolved, from the foregoing theorems, and those deduced from Prop. XXII. if we can ascertain in how many ways a number may be formed by the addition of the numbers 1, 2, 3, 4, &c. m , from a comparison of which we easily deduce the following

THEOREMS.

5. The number n may be parted into m unequal parts, in as many ways as the number $n - \frac{m \cdot m - 1}{2}$ may be formed by the addition of the numbers 1, 2, 3, 4, . . . m .

6. The number n may be parted into m equal, or unequal parts, as many ways as the number $n - m$ may be formed by the addition of the numbers 1, 2, 3, 4, . . . m .

From these two theorems (which are, in effect, the two general theorems deduced from Props. XXIII. and XXIV., except being in another form) we may derive these other two

THEOREMS.

7. The number n may be divided into m unequal parts, in as many ways as the number $n - \frac{m \cdot m - 1}{1 \cdot 2}$ may be divided into m parts equal, or unequal.

8. The number n may be divided into parts equal, or unequal in as many ways as the number $n + \frac{m \cdot m - 1}{1 \cdot 2}$ may be parted into m unequal parts. Euler's Analysis Infinitorum.

We shall now conclude this article by enumerating a few curious properties of numbers, that could not properly be introduced under any of the preceding heads; but for their investigations and demonstrations we must refer the reader to the works above quoted.

Miscellaneous Numerical Properties.

1. If a be a prime number, and x any number whatever not divisible by a , then will x^{a-1} be always divisible by a .

2. Every integer number is the sum of one, two, or three triangular numbers; of one, two, three, or four square; of one, two, three, four, or five pentagonal numbers; and so on for hexagonal, heptagonal, &c. numbers. This curious property was first discovered by Fermat, and proposed by him without demonstration, at page 180 of his edition of Diophantus; the case of squares has been proved both by Euler and La Grange, and that of the triangular numbers by Le Gendre; beyond which it still remains without demonstration, having resisted the efforts of several very distinguished analysts.

3. If n be a prime number, the product

$$1 \cdot 2 \cdot 3 \cdot 4 \cdot \dots \cdot (n-1) + 1$$

is divisible by n , so also is the product

$$1^2 \cdot 2^2 \cdot 3^2 \cdot 4^2 \cdot \dots \cdot \left(\frac{n-1}{2}\right)^2 \pm 1,$$

the ambiguous sign being $+$ when n is a prime number of the form $4a - 1$, and $-$ when it is of the form $4a + 1$.

4. The expanded binomial $(1 - 1)^n$

$$= 1 - n + \frac{n(n-1)}{1 \cdot 2} - \frac{n(n-1)(n-2)}{1 \cdot 2 \cdot 3} + \&c. = 0;$$

and if these terms be respectively multiplied by the series 1, 2, 3, 4, &c. or any power of these terms except the n th, the whole expression will be still equal to zero.

5. The continued product $1 \cdot 2 \cdot 3 \cdot 4 \cdot \dots \cdot n$ is expressed by the formula $n^n - n(n-1)^n + \frac{n(n-1)}{1 \cdot 2}(n-2)^n -$

$$\frac{n(n-1)(n-2)}{1 \cdot 2 \cdot 3}(n-3)^n + \&c.$$

6. Every square number is either divisible by 5, or will leave a remainder plus or minus 1.

Every cube number is either divisible by 7, or will leave also the same remainder ± 1 ; and generally we have

$$\begin{array}{ll} x^2 = 3n, \text{ or } 3n + 1 = 5n, \text{ or } 5n \pm 1 \\ x^3 = - & = 7n, \text{ or } 7n \pm 1 \\ x^4 = 5n, \text{ or } 5n + 1 = - & \\ x^5 = - & = 11n, \text{ or } 11n \pm 1 \\ x^6 = 7n, \text{ or } 7n + 1 = 13n, \text{ or } 13n \pm 1 \\ x^7 = - & \\ x^8 = - & = 17n, \text{ or } 17n \pm 1 \\ x^9 = - & = 19n, \text{ or } 19n \pm 1 \\ x^{10} = 11n, \text{ or } 11n + 1 = - & \\ x^{11} = - & = 23n, \text{ or } 23n \pm 1 \\ x^{12} = 13n, \text{ or } 13n + 1 = - & \end{array}$$

which formulæ are very convenient for determining whether a proposed number be a complete power without the trouble of extraction.

We might have added here several other curious properties of numbers; but having already extended this article to a considerable length, we must refer the reader who is desirous of entering farther into this subject, to Barlow's Theory of Numbers, where he will find a great variety of such properties, with their several applications to arithmetic, analysis, geometry, trigonometry, &c.

NUMBERS, for the Manner of characterizing, see NOTATION.

For that of expressing or reading those already characterized, see NUMERATION.

NUMBER, for the Measure of a . See MEASURE.

NUMBER, Golden, in Chronology. M. Cassini defines the golden number by the number of years elapsed since that which had the new moon on its first day; as that of the year 1500, whose golden number was 0; which he takes for his epocha.

NUMBER, Golden, is also used, with somewhat less propriety, for a period of 19 years, invented by Meton the Athenian; at the end whereof, the same lunations return in the same days, though not precisely in the same hour and minute of the day; but within an hour and a half of the same time.

In which sense, golden number amounts to the same with what we otherwise call lunar cycle, or Metonic year.

Hence this period, called by the Greeks *enneadecaeteris*, is not perfectly just; there being a proemptions, or leap, at the end of each 312 years; i. e. in that time the lunations fall out a day sooner than the golden number expresses them.

This, among other things, was what engaged pope Gregory XIII. to reform the calendar, to throw out the golden number, and substitute the cycle of epochs instead of it, for the

the use of the golden number, which, in the Julian calendar, serves to find the new moons, only serves, in the Gregorian, to find the cycle of epacts.

This number is said to have had its name, *golden*, from the extent of its use; or, otherwise, because the Athenians received it with so much applause, that they had it written in the public market in letters of gold. See *Metonic Cycle*, and *Epact*.

NUMBER, in *Grammar*, is a modification of nouns, verbs, &c. to accommodate them to the varieties of their objects, considered with regard to number.

Nouns, or names, agreeing to several things, may be considered either as applied to one of those things singularly, or to a number of them; and those either considered as several, or as united. To distinguish these cases, two numbers have been invented, the *singular* and *plural*.

When a noun indicates an object considered as single, or alone, or a number of them considered as united together, it is said to be of the *singular* number; as a tree, a troop, a temple.

When it indicates several objects, and those as distinct, it is of the *plural* number: as trees, or temples. Thus, when I speak of myself, as making part of several others, instead of I, I say, we, &c.

The Greeks have a third number, which they call the *dual* number, as signifying two. The Hebrews have something like it; but then it only takes place when the words signify a thing double, either by nature, as the hands, the eyes, &c. or by art, as scissars, tongs, &c. As to common and appellative names, they seem all naturally to require a plural number; yet there are several, which have none, as the name of gold, steel, &c.

The difference of numbers in nouns is expressed by a difference of termination or ending.

In English, the singular is usually converted into plural, by adding *s*; as tree, trees; hand, hands; &c. Where the pronunciation requires it, as when the singular ends in *s* or *x*, *sh* or *ch*, it is usually done by the addition of *es*, instead of *s*.

The plurals of adjectives, though varied from the singulars in most other languages, yet in English are generally the same.

NUMBERS, in *Poetry*, *Oratory*, *Music*, &c. are certain measures, proportions, or cadences, which render a verse, period, or song agreeable to the ear.

Poetical and *prosaic* numbers are somewhat different.

NUMBERS, *Poetical*, consist in a certain harmony in the order, quantities, &c. of the feet and syllables; which make the piece musical to the ear, and fit for singing; for which all the verses of the ancients were intended. See *RHYTHM*.

It is of these numbers Virgil speaks in his fourth eclogue:

———“Numeros memini, si verba tenerem.”

And again, in the sixth eclogue:

“Tum vero in numerum faunosque ferasque videres
Ludere.”

The numbers are what constitute the air and character of a verse; and denominate it smooth, or soft, or low, or rough, or sonorous. The following lines of Milton furnish an instance of soft, easy numbers:

“Then feed on thoughts, which voluntary move
Harmonious numbers; as the tuneful bird
Sings darkling, and, in shadiest covert hid,
Tunes her nocturnal note. ———”

How different from the numbers of these!

“Arms meet with arms, fauchcons with fauchcons clash,
And sparks of fire, struck out from armour, flash.”

NUMBERS, *Rhetorical*, or *Prosaic*, are a sort of simple unaffected harmony, less glaring than that of verse, yet such as is perceived, and affects the mind with pleasure. The numbers are that, by which the style is said to be easy, free, round, flowing, &c. See *STYLE*.

A fine instance of numbers we have in that passage of Tully for Marcellus: “Nulla est tanta vis, tantaque copia, quæ non ferro ac viribus debilitari frangique possit.” All the beauty of which would be entirely lost to any tolerable ear, if the numbers were a little inverted, thus: “Nulla est vis tanta, et copia tanta, quæ non possit debilitari frangique viribus et ferro.”

Numbers are things absolutely necessary in all writings, and even in all speech. Hence Aristotle, Tully, Quintilian, &c. lay down abundance of rules as to the best manner of intermixing dactyls, spondees, anapæsts, iambuses, choriæ, and dichoriæ molossuses, &c. in order to have the numbers perfect.

The substance of what we have said, is reducible to what follows: 1. The style becomes numerous, by the alternate disposition and temperature of long and short syllables; so as that the multitude of short ones neither render it too hasty, nor that of longer ones too slow and languid. Thus Tully to Cæsar: “Domuiti gentes immanitate barbaras, multitudo innumerabiles, locis infinitas, omni copiarum genere abundantes, &c.”

Sometimes, indeed, long or short syllables are designedly thrown together, without any such mixture, to paint the celerity or slowness of a thing by that of the numbers; as,

“Quadrupedante putrem fonitu quatit ungula campum.”

Æneid. l. 8.

“Luctantes ventos, tempestatemque sonoras.”

Id. l. 1.

2. The style becomes numerous by the intermixing words of one, two, or more syllables; e.g. “Vivis; et vivis non ad deponendam, sed ad confirmandam audaciam.” Whereas the too frequent repetition of monosyllables renders the style pitiful and grating: e. gr. “Hac in re nos hic non ferit.”

3. It contributes greatly to the numerousness of a period; to have it closed by magnificent and well-sounding words; as, “Qui locus quietis ac tranquillitatis plenissimus fore videbatur, in eo maximæ molestiarum, et turbulentissimæ tempestates extiterunt.”

4. The numbers depend not only on the nobleness of the words in the close, but on those of the whole tenor of the period; as in that fine oration of Cicero for Fonteius, a brother of one of the Vestal maids; “Nolite pati, iudices, aras deorum immortalium, Vestræque matris, quotidianis virginum lamentationibus de vestro iudicio commoveri.”

5. To have the period flow easily and equably, the harsh concurrence of letters and words is to be very studiously avoided, particularly the frequent meeting of rough consonants; as *ars studiorum, rex Xerxes*: the beginning the first syllable of a word with the last of the preceding; as, *Res mihi invise sunt*: the frequent repetition of the same letter or syllable; as in that verse of Ennius:

“Africa terribili tremat horrida terra tumultu;”

and the frequent use of like ending words; as *amatrices, ajutrices, prestigiatrices, fuerunt*. See *JUNCTURE*.

Lastly, the utmost care is to be taken, lest in aiming at *oratorical* numbers, you should fall into *poetical* ones; and instead of prose write verse; which even Cicero himself is sometimes guilty of: witnes "Cum loquitur, tanti fletus gemitusque fiebant."

With regard to English composition, the following cautions should be observed: a number of monosyllables should not be crowded together, nor several words of the same termination, especially if the accent falls on the same syllable in each of them; nor should a sentence end with a monosyllable: to which may be added, that very long words are not suited to the beginning or conclusion of a period. Ward's *Orat.* vol. i. p. 380, &c.

NUMBERS, Planetary. The numbers which are usually understood by the denomination *planetary*, are those which are, or may be, applied in planetary clocks, orreries, and planetaria, in the construction of their wheels and pinions; for the desired rotations and revolutions of the balls that represent the planets, depend on the respective numbers of teeth employed in such wheels and pinions. These numbers are, therefore, of great importance in the representation of planetary motion, inasmuch as the relative velocities are entirely regulated thereby, and the addition or omission of a single tooth in either a wheel or pinion may produce an error in defect or excess of days, weeks, or months, in the whole period, accordingly as the planet has a short or long period to revolve in. In any planetary machine, the velocity of the first moving wheel or pinion must be to the velocity of the last in a given pair, or in a given train of wheels and pinions, in the same proportion, as nearly as may be, as the period assumed for the revolution of the first is to the period intended to be produced in a planet immediately connected with the last, which is sometimes called the planetary wheel, though, properly speaking, they are all planetary wheels, by reason of their teeth being made to consist of planetary numbers, previously calculated. To ascertain numbers suitable for planetary wheelwork, both as to accuracy and practical convenience, is to select out of all the infinite variety of numerical figures, that permutation would produce, those particular relative numbers that fulfil the conditions best, and that could not be changed for others without disadvantage; and various ingenious men have devised methods of determining such numbers, though with different degrees of success, from the time of Huygens and Roemer down to the present moment. Graham, Rowley, Defaguliers, Martin, and Ferguson, have each laboured to procure good planetary numbers for their respective machines, and have left behind them models of different constructions, which have been copied by the English instrument makers, who have from time to time succeeded them, though it will presently appear, that none of these models effect a good representation of the planetary motions; for, in the first place, the tables of those motions were not sufficiently correct during the lives of those authors; in the next place, the most accurate numbers were not ascertained for producing the motions they aimed at; and thirdly, five primary planets and eight secondaries have been discovered since their time, for which no planetary numbers were or could be calculated on that account. These discoveries in astronomy have, however, lately led to corresponding improvements in planetary mechanism, and a clergyman, who has made planetary numbers a subject of his studies, and to whom we are indebted for this article, as well as for several others connected with it, has superintended the construction of different illustrative machines for himself or friends, which are as yet unknown to the public, but which it is our intention to describe under their proper titles

of ORRERY and PLANETARIUM, when we arrive at those articles. In the mean time, the reader will be enabled to judge of the comparative merits of such machines, by a careful perusal of our present article, which naturally divides itself into three heads; *viz.*

1st. That which relates to the exact periods of the planetary revolutions;

2dly. That which regards the periods as produced by wheelwork already constructed; and,

3dly. That which regards the calculation of planetary numbers intended to produce an exact representation of those periods.

For the sake of perspicuity, we propose to confine ourselves to this order; but each of the two last heads will be subdivided into distinct *cases*, for the purpose of affording practical examples in each case, such as may serve at once to illustrate the theory, and to promote the practical application of planetary numbers, in the examination and actual construction of machines for illustrating the solar system.

The first head that presents itself to our consideration is that which relates to the exact periods of the planetary revolutions themselves, so far as the present state of our knowledge goes; for should our data be assumed erroneously, our calculations depending on them will be defective in accuracy. We are therefore unwilling to copy the accounts of our predecessors, which have been handed down without due attention to correctness, and which our contemporaries have not taken the trouble to correct, since the most perfect tables were published, out of which we collect the tropical revolutions, subjoined, as published in La Lande's last edition, which revolutions are preferable to the periodic revolutions on account of their allowing for the precession (or retrocession) of the equinoctial points, and thereby making the motions correspondent to the signs as given in the Nautical Almanac and White's Ephemeris, which register the apparent places of the heavenly bodies, and phenomena arising out of their relative motions.

The tables of the planetary motions are so arranged in columns for years, months, days, hours, minutes, and seconds, that we may readily collect from them the mean motion in its orbit of any planet corresponding to any given amount of time; or, on the contrary, the time corresponding to any given quantity of mean motion; and if we assume twelve signs, or an entire revolution in the ecliptic, as the motion given for each planet, we shall have the times corresponding, as we have arranged them below, for the tropical periods of those planets which have had their tables completed. We will take them in the order of their distances from the sun thus:

MERCURY.	11	26	2	12	=	87 days.
	0	3	55	19	=	23 hours.
	0	0	2	23	=	14 minutes.
	0	0	0	6	=	35.2 seconds.

The amount 12 0 0 0 = 87^d 23^h 14^m 35^s.2 for the whole tropical period.

VENUS.	11	28	53	9	=	224 days.
	0	1	4	5	=	16 hours.
	0	0	2	44	=	41 minutes.
	0	0	0	2	=	30 seconds.

The amount 12 0 0 0 = 224^d 16^h 41^m 30^s for the tropical period.

EARTH.

EARTH.	11	29	45	40.5	=	365 days.
	0	0	12	19.2	=	5 hours.
	0	0	1	58.3	=	48 minutes.
	0	0	0	2	=	48 (also 49) seconds.

The amount 12 0 0 0 = 365^d 5^h 48^m 48^s or 49^s for the solar year.

MARS.	6	11	17	9.4	=	365 days.
	5	18	13	36.8	=	321 days.

Sum	11	29	30	46.2	=	686 days.
	0	0	28	49.4	=	22 hours.
	0	0	0	24.4	=	18 ^m 37 ^s .

The amount 12 0 0 0 = 686^d 22^h 18^m 37^s for the tropical period.

JUPITER.	1	0	20	31.7	=	365 days.
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Multiply by 11

11	3	45	48.7	=	365 × 11 = 4015 days.
0	25	46	12	=	310 days more.
0	0	24	56.3	=	5 days in addition.

Sum	11	29	56	57	=	4330 entire days.
	0	0	2	54.6	=	14 hours.
	0	0	0	8.4	=	40½ minutes.

The amount 12 0 0 0 = 4330^d 14^h 40^m 30^s for the tropical period.

SATURN.	0	12	13	36.8	=	365 days.
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Multiply by 29

11	24	34	47.2	=	365 × 29 = 10585 ^d
0	5	11	32	=	155 days more.
0	0	12	3.6	=	6 days in addition.

Sum	11	29	58	22.8	=	10746 entire days.
	0	0	1	35.5	=	19 hours.
	0	0	0	1.7	=	20 minutes.

The amount 12 0 0 0 = 10746^d 19^h 20^m for the tropical period.

GEORGIAN OR HERSCHEL.	0	4	17	44.2	=	365 days.
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Multiply by 9

1	8	39	37.8
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Again by 9

11	17	56	40.2	=	81 × 365 = 29565
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Add more 0 8 35 28.4 = 2 × 365 = 730

Also 0 3 24 47 = 290

And 0 0 2 49.5 = 4

Sum	11	29	59	45.1	=	30589 days.
	0	0	0	14.1	=	8 hours.
	0	0	0	0.8	=	27 minutes.

The amount 12 0 0 0 = 30589^d 8^h 27^m for the tropical period.

The periods thus ascertained agree very nearly with those given by professor Vince, as copied from La Lande's Re-

port without further examination, except in the instance of Herschel, in which there is a difference of upwards of 222 days!

How so great a variation has arisen between the tables and the period assigned to Georgian by so able and accurate an astronomer as La Lande, we are left to conjecture. In one part of his valuable work, this author says that the tropical diurnal motion of this planet is 42'' 678026, which is probably the daily motion at first assigned as an approximate motion, before the true one was ascertained, and which has not been subsequently corrected; and if we divide 1296000'', the number of seconds in the ecliptic, by this number, we shall have a period of 30366.91528 days, or 83 tropical years, 51 days, 19 hours, and 37.44 seconds; but, according to the last edition of the tables, the mean tropical daily motion, on an average of 365 days, comes out only 42'' 36712, by which, if we divide 1296000'', as before, we shall gain a period of more than 30589 days, which agreement with our period just ascertained from the tables, constitutes a check on our process of collecting the period from the said tables. Indeed, since the discovery was made of this error in La Lande's Report of the period of Georgian, (which was communicated to Dr. Thomas Young during the time of his lecturing at the Royal Institution, and corrected in his lectures), we learn that baron Von Zach, of Saxe Gotha, has given a period of 30589.36 days to this planet, which circumstance corroborates our former conclusion, which we here mention, not only because it is connected with our present article, but also because professor Vince, Dr. Olivarius Gregory, Dr. Kelly, and other modern writers on astronomy, have copied the error we have here pointed out, and have involuntarily lent their sanction to its propagation.

With respect to the exact length of the solar year, the determinations of Dr. Halley, Flamsteed, and sir Isaac Newton, as well as of Cassini and Mayer, have yielded, in public opinion, to those of La Lande and De la Caille, the former of whom, in his "Memoire sur la veritable Longueur de l'Année astronomique," which gained the prize proposed by the Royal Society of Copenhagen for the year 1780, by comparing a great number of the most distant and authentic observations, determined the length of the mean solar year to be 365^d 5^h 48^m 48^s; but De la Caille's determination of 49^s has been followed by Von Zach in his "Abridgment of the Solar Tables," while, as Biot informs us in his "Traité Elementaire d'Astronomie Physique," 1810, M. de Lambre in his last tables makes the solar year 365^d.242264, or 365^d 5^h 48^m 51^s.696, which accords very nearly with Cassini's determination from a mean of all the authentic observations on the equinoxes. But if we adopt, as our standard, a period coming within one second of the mean of all these determinations, the other periods to be compared with it, and constituting so many ratios, will not be deemed inaccurate.

Of the tropical revolutions of the four diminutive planets, that have been discovered within the present century, the periods are not yet so accurately known, as to exclude future corrections from time to time, as observations may be multiplied; we therefore caution our readers against considering the periods at present assigned to them, as deserving any other name than *approximate*, or approaching towards the truth. We have carefully examined and compared both the French and German accounts, that have hitherto been given, of the elements of these planets, and according to the present state of our information (1813), the following may be considered as the most correct tropical periods;

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periods; which, therefore, we adopt for the present till more accurate ones are deduced: *viz.*

	D.	H.	M.
Of Vesta	1335	0	23
Juno	1590	17	35
Ceres	1681	6	15
Pallas	1681	10	26

The Sun.—The period of the sun's rotation, as it regards a star or fixed point, has been given differently by different authors; some making it $25^d 6^h$, others $25^d 24^h 8^m$, and others $25^h 15^m 16^s$. But the time most to be depended on, is that which La Lande determined from observations made in the beginning of the year 1798: at which time, the writer of this article recollects having noticed the continuance of the same solar spot for nearly three entire rotations of the sun, before it changed or disappeared. The memoir was read at the public sitting of the French National Institute, in which the spot is stated to have returned to the same situation relatively to the earth in $27^d 7^h 37^m 28^s$; from which was deduced the period $25^d 10^h$, for the exact time of a rotation, as it respects a fixed point in the heavens. This period was deduced in the following manner: the exact quantity of the sun's apparent motion in the ecliptic, corresponding to $27^d 7^h 37^m 28^s$, was ascertained from the solar tables, which may be called t ; then as $360^\circ + t : 27^d 7^h 37^m 28^s :: 360^\circ : 25^d 10^h 0^m$, for the exact time of a rotation; which we will consider as sufficiently accurate, till some solar spot of longer continuance may hereafter appear.

The Moon.—As the different periods of the moon's revolution with regard to the sun, her node, and apogee, have been given agreeably to La Lande's latest determination, under our article MOON, it would not be necessary to enter on the subject here, provided the years there stated had been tropical years of $365^d.24222$, instead of civil years of 365^d each; but as the tropical or solar year is taken in our calculation of planetary numbers, as the standard by which the periods of the planets are measured, it is requisite to convert the lunar numbers into terms of the same denomination. The tropical period of the node is taken, according to the best tables, at $6798^d 4^h 52^m 52^s$; which time, divided by 365.24222 , gives $18^y 223^d 19^h 41^m 24^s$ for the said period in tropical years; and $3231^d 8^h 34^m 57^s.6$, the tropical period of the apogee, divided by the same numbers, produces $8^y 309^d 10^h 4^m 45^s$ of a similar denomination: from which periods, lunar wheels must be calculated, in order that the moon's motions may be referred to the ecliptic, and the phenomena indicated agreeably to true solar time.

Jupiter's Moons.—The periods of Jupiter's moons, to be represented by wheelwork in any machine, are the synodic, which being of frequent recurrence, are now ascertained with great accuracy, agreeably to the subjoined table, *viz.*

Sat.	D.	H.	M.	S.
1.	1	18	28	36
2.	3	13	17	54
3.	7	3	59	36
4.	16	18	5	7

We omit giving, in this place, the periods of the other secondaries, which will be given in their places; because their motions afford no phenomena of service in navigation or geography, and are therefore omitted in planetary machines, as being calculated to enhance the expence, without being of any real service in explaining the system.

Our second head of this article is that which regards the periods of the planets, as produced by wheelwork already constructed, and which will enable the reader to appreciate

the accuracy of any numbers adopted by the mathematical instrument makers.

The cases which have occurred, in our examination of different instruments, may be classed into seven, according to the subjoined arrangement, *viz.*

1. When a simple motion is produced by means of one wheel and a corresponding pinion.

2. When a simple motion is produced by a train of wheels and pinions.

3. When a simple motion is produced by the agency of a worm, or endless screw, actuating a wheel.

4. When a compound motion is effected partly by the action of wheels and pinions, and partly by a moveable bar or box, which supports some portion of the mechanism.

5. When an *apparent* progressive motion is caused by the difference of two comparative motions.

6. When an *apparent* retrograde motion is caused by the difference of two comparative motions.

7. And lastly, when by means of two equal, contrary, or counteracting motions, the parallelism of a wheel's axis is preserved, as it regards a given original position.

Before we treat these seven cases successively, let it be premised, that the wheel or pinion, which actuates or *drives* its fellow, will be invariably called the *driver*, and the other the wheel or pinion *driven*. The different methods of computing the value of any portion of wheelwork will, it is presumed, require no other mathematical knowledge than an acquaintance with the nature of fractions, vulgar and decimal; which we must suppose to be familiar to every mathematical instrument maker.

Case. 1.—When a simple motion is produced by means of one wheel and a corresponding pinion, let the number of teeth, which each contains, be carefully counted and noted down, and also which of the two is the *driver*: then, whatever be the assumed time of a revolution of the driver, the numbers of the wheel and pinion will constitute a ratio, which is a fraction of that time, proper or improper, according as the *driver* is the greater or smaller number; which driver must be, in all instances, the *denominator*. The value of the fraction thus constituted, it will be superfluous to scientific readers to say, is found by multiplying the assumed time of a revolution of the first mover by the numerator, and dividing by the denominator; the remainders being reduced into their next lowest denomination of time, after every successful division. An example will render this simple case intelligible by every reader.

Suppose that a wheel, consisting of 75 teeth, and revolving once in a tropical year, drive a pinion of 6; and that it be required to know in what time the latter revolves, the work at full length will stand thus:

$$\begin{array}{r} \text{D. H. M. S.} \\ 365.24222 = 365^y 5^d 48^h 48^m \\ \quad \quad \quad 6 \end{array}$$

$$\begin{array}{r} 75)2191.45333(29 \text{ Days.} \\ \underline{150} \end{array}$$

$$\begin{array}{r} 691 \\ 675 \\ \hline 16.45333 \\ \quad \quad 24 \end{array}$$

$$\begin{array}{r} 6581333 \\ \underline{3290666} \end{array}$$

Carry over 75)394.87999(5 Hours.
D d

75)394.87999(5 Hours.

375

19.87999
60

75)1192.79999(15 Minutes.

75

442

375

67.79999
60

75)4067.99999(54.24 Seconds.

375

317

300

17.9

15.0

29

30

Hence it appears, that $\frac{6}{75}$ ths of 365.2422 days is equal to $20^d 5^h 15^m 54^s.24$.

The computation may be sometimes abridged, by converting the vulgar fractions into a decimal, where there is no remainder, and then by multiplying thereby, instead of dividing; thus:

75)6.00(.08
6.00

365.24222
.08

29.2193777 Days.
24

8775111

43875555

5.2650666 Hours.
60

15.9040000 Minutes.
60

54.2400000 Seconds.

Either of these methods may be used with a like result.

If, instead of the wheel, we make the pinion the driver, or denominator of the fraction, the motion of the second mover will then be retarded; for $\frac{2}{75}$ ths of 365.24222 days is equal to $4565^d 12^h 36^m$. This difference in the two revolutions, when the parts of the fraction are reversed, points out the necessity of attending very accurately to the circumstance of the *driver* being made the *denominator* of the *fraction*.

The revolutions of the primary planets in the common planetarium, where there is only one pair of wheels to each planet, are estimated by this case.

When it happens that one of the pair is immoveably fixed, and the other put in motion by being carried round it, whilst their teeth are connected, the fixed wheel is the cause of motion, and is therefore to be called the driver.

But the velocity, or *measure* of motion, in any particular wheel, is not the only effect that is to be attended to in astronomical mechanism, the *direction* of motion is also to be observed, on which account it may be worthy of remark here, that when a wheel or pinion revolves round the *outer* edge of a fixed wheel by means of a moveable bar, it turns in the *same* direction in which the bar itself moves; but when it revolves by means of a connection with the *inner* edge of a fixed ring, it revolves in a *contrary* direction. Also, in a contrate wheel the motion may be either direct or retrograde, accordingly as the teeth are cut in the upper or under face of the wheel; and in bevel wheels it is requisite to notice whether the horizontal wheel be placed above or below the vertical one.

Case 2.—When a simple motion is produced by a train of wheels and pinions, the ratio of velocity between the first and last movers is thus ascertained: multiply all the driven pinions or wheels into one another for one numerator, and all the drivers in like manner for one denominator; for instance, suppose that a wheel of 40 drive a pinion of 8, on the arbor of which is a wheel of 42 driving another pinion of 6, and that on the arbor of this last be a third wheel of 56 driving a third pinion of 7; then the operation abridged

will stand thus: $\frac{8}{40} \times \frac{6}{42} \times \frac{7}{56} = \frac{336}{94080} = 280$; whence it

appears that the number of revolutions gained is 280, which would have been so many lost, had the pinions been the drivers. By this general rule the trains of all the planets in orreries may be computed, however complex, provided the *supporters* of the wheelwork be fixed in a stationary position. After a train is reduced to a simple fraction, the *time* corresponding to it is ascertained exactly as in *Case 1*. Thus, in the instance before us, if the first wheel of 40 revolve once in a tropical year, the last pinion of 7 will be carried round

in $\frac{336}{94080}$ of 365.24222 days, which time is equal to $1^d 7^h 18^m 23^s.3$.

In any train of wheelwork, the wheels or pinions placed on the first, third, fifth, &c. arbors, all revolve in the same direction, and those placed on the second, fourth, sixth, &c. revolve in the contrary direction, whence it sometimes becomes necessary to add an intermediate wheel or pinion, merely to change the *direction* of motion, or otherwise to connect two wheels, which are necessarily placed too far from each other to act immediately together; now, whenever a wheel or pinion of this description is met with, as it gives a tooth for every tooth which it takes, it must be considered as acting in the double capacity of a driver, and a wheel or pinion driven, and will consequently stand both as numerator and denominator of the fractional portion which it represents; but as every fraction which has its numerator and denominator alike, is equal to *unity*, and as unity, taken as a multiplier or divisor, does not alter the value of any multiplicand or dividend, every wheel or pinion acting in a *double capacity*, whatever be its number, may be entirely omitted in computing the value of a train.

Case 3.—When a simple motion is produced by the agency of a worm or endless screw actuating a wheel, the structure of the screw must be carefully examined; *i. e.* whether there be one or two threads, and whether the inclination thereof be such as to produce a direct or retrograde motion in the wheel which it impels; these things being noted, the screw must be considered as performing the office of a pinion of one or two leaves, as the case may be, the construction of which is impracticable: the manner of estimating the agency of

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of a screw, is, therefore, similar to that of a pinion,—by Case 1, if there be only one wheel, but by Case 2, if there be a train.

The lunar train of Mr. Ferguson's orrery, which we shall have occasion to examine under our article ORRERY, affords an example for this case, where it will be seen that the drivers may be either wheels, pinions, or endless screws, provided they are put down as the denominators of their respective fractions.

Case 4.—When a compound motion is effected partly by the action of wheels and pinions, and partly by a moveable bar, which supports some portion of the mechanism, the effect is not so easily computed as in the foregoing cases; for besides the revolutions produced by a train of wheelwork, according to Case 2, it will be necessary to add or subtract an additional calculation, according as the wheels on the moveable bar are circumstanced with respect to those which are not carried thereby: a few instances will elucidate this case.

In Mr. Ferguson's orrery, the train of wheels which produce a revolution of Venus, is $\frac{25}{8} \times \frac{69}{7} \times \frac{73}{10} = 224^d 20^h 47^m 1^s$, according to the rules laid down in Case 2, and Mercury's revolution is occasioned by $\frac{18}{28}$ of this train placed

on the arm of Venus, or is equal to 1.555 revolutions in one of Venus; but the arm of Venus *pushes* Mercury's last wheel once round in the same time, by means of a connection with its teeth, as may be seen in the author's "Select Mechanical Exercises," page 83—85; consequently $\frac{244.86606}{1 + 1.55555}$, which is equal to $87^d 23^h 47^m 24^s$, is the exact length of a revolution of Mercury, as produced by the joint agency of the wheelwork and moveable arm.

For another example, let us suppose that A be a central wheel of 40, moving, by means of a train, 50 times round in a tropical year, from west to east, and B another wheel of 20, carried round it by an arm, whilst their teeth are connected, in a contrary direction, *viz.* from east to west, once in the same time; now while the wheel A of 40 revolves 50 times, it is evident that the driven wheel B of 20 must revolve 100 times, provided the motion of the arm which supports it be out of the question; but if we consider that the arm and wheel B both revolve in the same direction, from east to west, it is equally evident that this wheel will revolve *twice* in being carried round the wheel A, even though that wheel were at rest; so that $100 + 2$ or 102, is the true number of revolutions that the wheel B makes whilst the arm revolves once.

If, however, we suppose the said wheel A to revolve from east to west, instead of from west to east, the wheel B will in this predicament turn in a direction contrary to that of the arm, and whilst it is making 100 revolutions from west to east, will make two from east to west, the first occasioned by the wheel A only, and the second by the arm carrying it in a contrary direction; so that $100 - 2$ or 98, will be the number of revolutions effected under these circumstances. In the former instance

the value will be $\frac{1}{50} \times \frac{20}{40} + \frac{40}{20}$ of a year, and in the latter

$\frac{1}{50} \times \frac{20}{40} - \frac{40}{20}$ of the same.

Let us again suppose B to be 16, and A as before 40, then one instance will give $\frac{1}{50} \times \frac{16}{40} + \frac{40}{16} = 127\frac{1}{2}$, and the other $\frac{1}{50} \times \frac{16}{40} - \frac{40}{16} = 122\frac{1}{2}$.

From these examples the reader will be able, it is presumed, to compute the effect of any wheelwork that may fall under this case; but it must be recollected, that in every instance where a moveable arm carries any wheel round a central one, the central, even though the *driving* wheel, must be made the *numerator* of the additive or subtractive fraction, which is *annexed* to the calculation depending upon the train, as computed by Case 2; otherwise an error of considerable magnitude will ensue, as will appear when we come to examine, by this case, the diurnal motion of some of the modern tellurians.

Case 5.—When an apparent progressive motion is caused by the difference of two comparative motions, as is that of the moon's apogee point, compared with the small revolving ecliptic plate in Mr. Ferguson's instruments, called the "Calculator," and the "Mechanical Paradox," subtract the number of the smaller of the two wheels from that of the greater, and see how often the difference is contained in the *greater*: this quotient will express the number of revolutions of the driving wheel during which one apparent progressive revolution will be gained by the other.

Let us first take $\frac{62}{55}$, the numbers of the calculator, for an example; their difference is 7, and $\frac{62}{7}$ is equal to $8\frac{6}{7}$ years, or 8 tropical years and 313.06476 days: in this example the driving wheel of 55 revolves once in a year, and impels the wheel of 62, which may be called the apogee wheel, once round in a retrograde direction, except the space of seven teeth in the same time; the small ecliptic plate also revolves in a retrograde direction once in a year; consequently, as the retrogradation of the apogee wheel is slower than that of the ecliptic plate, it *appears* to an observer to *advance progressively* the space of seven sixty-second parts of a circle in every year, and by this apparent motion indicates the mean motion of the moon's apogee in the ecliptic.

As a second example, let the numbers of the mechanical paradox be taken, which are $\frac{44}{36}$; here the difference is 5, and $\frac{44}{5}$, or $8\frac{4}{5}$, is equal to a period of 8 tropical years and 292.1936 days.

When a train of wheels and pinions is employed to produce the progressive motion of the apogee point, as is done in the common lunarium, it must first be reduced into a simple fraction by Case 2, and then estimated by this case as though one pair of large wheels constituted the fraction.

Case 6.—When an apparent retrograde motion is caused by the difference of two comparative motions, as in the case of the moon's nodes, compared with the little ecliptic plate in the lunarium, and some of the larger orreries, subtract, as in the last case, the smaller of the two wheels from the larger, and see how often the difference is contained in the *smaller*: the quotient will give the number of revolutions in the driving wheel during which one *retrograde* revolution will be effected by the other. Thus, in Mr. Ferguson's orrery, the

D d 2 wheels

wheels for the moon's nodes are $\frac{56}{59}$, and $\frac{56}{3} = 18\frac{2}{3}$, gives 18 years and 243.49481 days for the period of their retrograde revolution. Also, in the mechanical paradox of Mr. Ferguson, the wheels $\frac{37}{39}$ produce the same kind of revolution in $\frac{37}{2}$

or $18\frac{1}{2}$ half years. In this case the retrogradation of the driven wheel is quicker than that of the ecliptic plate, on which account the *apparent* motion of the nodes is retrograde, viz. the reverse of the last case; for there the *loss* of velocity appears to be *progressive motion*; but here the *gain* of velocity constitutes the *apparent retrograde* motion; whereas, in point of fact, in both cases the apparent motion is only the difference of two unequal motions in the same direction. A movement of wheels and pinions may here also be reduced into a simple fraction, and then estimated by the present case.

Case 7.—The parallelism of a wheel's arbor, which is carried by a moveable arm round a central point, is preserved by means of *one* revolution of that wheel, in a direction *contrary* to that of the arm, in the *same time* that the arm is carried round: for whilst the *progressive* motion of the arm is carrying any individual point of the wheel towards one side of any distant object, the retrograde motion of the wheel carries the same point just as far towards the other side of the same object, so that these two contrary motions, like the signs of addition and subtraction, counteract each other, and there appears to be no revolution at all: thus the same point of the wheel, and consequently the remote end of an arm placed on its revolving arbor, will continue to point towards the same distant point in every part of its revolution. In order, therefore, to judge of the accuracy of the parallelism of any wheel's arbor, or planet's axis borne by it, in every part of its revolution, it is only necessary to examine whether it revolves *exactly once* in each revolution of the arm which supports it, in a direction *contrary* to that of the arm; it is of no consequence, in point of accuracy, by what mechanism this effect is produced. It is by a contrivance to effect this purpose, that the earth's axis and small ecliptic plate in all the tellurians, lunaria, and orreries are, or ought to be, preserved parallel to a required original situation: but we shall have occasion hereafter to point out a defect in this respect in some of our modern instruments.

The third head that we proposed to treat of, is to determine by calculation planetary numbers proper for wheelwork, which shall produce a given effect. The most systematic way of laying down the various rules for doing this, will be to reverse the seven cases of which we have seen the application; for the fundamental directions for determining the numbers proper for wheelwork to produce a given effect, bear the same relation to those laid down under our last head, for computing the value of wheelwork already constructed, that analysis does to synthesis; the reader, therefore, must bear in mind, that in those cases where multiplication or addition were used there, division or subtraction will be necessary here; and to prepare him gradually for entering upon the more difficult calculations where prime numbers occur, we shall select such examples only in the exemplification of these seven reversed cases as admit of commensurable fractions.

Case 1.—When a pinion is required to revolve any given number of times for its wheel once, as suppose 10, it is only necessary to fix upon a suitable number for the pinion, and multiply the given number of revolutions thereby to ascer-

tain the number of teeth for the required wheel; thus, if the pinion chosen be 9, the wheel must be $9 \times 10 = 90$, so that $\frac{9}{90}$ will be the pair required to produce an increase of velocity in the ratio of 10 to 1; but if a decrease be required, then $\frac{90}{9}$ will be the proper pair.

When the number of revolutions consists of an integer and a fractional part, or what is usually called "a mixed number," as is generally the case, it must be reduced to a simple fraction, which will express the ratio of the wheel and its proper pinion: for instance, if $6\frac{3}{4}$ revolutions were required to be effected in a given time, the simple fraction or ratio would be $\frac{27}{4}$, or rather $\frac{4}{27}$, as there is to be an in-

crease of velocity, and as the denominator is to be made the driver; here, however, the 4 is too small a number to constitute a good pinion; let, therefore, both parts of the fraction be augmented in the same proportion, till they are both of a convenient practical size; in this instance, for most common purposes, the numerator and denominator may be

both *doubled*, by which means $\frac{8}{54}$ will be the wheel and pinion required.

This rule is not only easy to be understood by any person who understands the nature of vulgar fractions, but its application is general in all kinds of simple wheelwork which are placed in stationary positions. Had the tropical revolutions of the planets been given in books on astronomy in exact fractions of a solar year, or of any other definite period, these directions would have been sufficient for determining the wheelwork which falls under this case; but the periods are generally given in days, hours, minutes, and seconds, on which account it is necessary to reduce each period into its lowest denomination, and also the period, with which each is compared, into the same, and then reduce this large fraction into its lowest terms, by a continual alternate division, till there is no remainder, as directed in the common school books of arithmetic; then the fraction in its lowest terms will be the ratio for which the wheel and pinion are to be determined.

For the sake of exemplification, let us suppose that the tropical period of any heavenly body revolving round the sun, be $243^d 11^h 52^m 32^s$, and that a pair of wheels be required to produce this revolution, whilst the driver revolves in $365^d 5^h 48^m 48^s$: these periods, reduced into a simple fraction, will be $\frac{21037952''}{31556928''}$, which, in its lowest terms, is $\frac{2}{3}$; therefore, increasing both parts eight, nine, or ten times, we shall have $\frac{16}{24}$, $\frac{18}{27}$, or $\frac{20}{30}$, for the wheels required. In every

instance where a solar year is the denominator, the ratio of an inferior planet will be a *proper*; and of a superior one an *improper* fraction.

Case 2.—Whenever two periods which are compared together constitute a fraction, which, in its lowest terms, is composed of numbers too large for single wheels, a train of wheels and pinions becomes necessary to reduce the size of the simple wheels, which may be done thus; find, by a repetition of assumed divisors, or from a table for this purpose, what two or more numbers, usually called composite numbers or factors, multiplied into each other, will give

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give a product equal to the numerator, and substitute those numbers, with the sign of multiplication between each, for the numerator itself; do also the same for the denominator; and these will be the proper numbers to be transposed, augmented, or diminished, as circumstances may require, for a train of the same value as the original simple fraction. An instance or two will render this case familiar: let us take $\frac{629}{21}$ as the ratio of a superior planet

compared with the earth, the numerator of which is too large for a single wheel: now the two composite numbers for the numerator are 37 and 17, their product being equal to 629, and the two composite numbers for 21 are 7 and 3;

hence, instead of $\frac{629}{21}$, we have obtained $\frac{37 \times 17}{7 \times 3}$, or,

which is the same thing in the form of a train, $\frac{37}{7} \times \frac{17}{3}$, or

otherwise $\frac{37}{3} \times \frac{17}{7}$, it being a matter of no consequence

how the pinions are placed with respect to the wheels, provided they be both drivers: let now both parts of the $\frac{17}{3}$ be doubled, since 3 cannot be made into a good pinion,

and the requisite train will be $\frac{37}{7} \times \frac{34}{6}$.

Again, let us take $\frac{35}{621}$ for the ratio of an inferior planet; the composite numbers will be respectively 7×5 ,

and 27×23 , constituting a train of $\frac{7}{27} \times \frac{5}{23}$, or $\frac{14}{54} \times \frac{10}{46}$,

if they have all their parts doubled. By this contrivance two small wheels with corresponding pinions answer the same purpose as one very large wheel and its pinion, and are not only much more easily made, but rendered more portable for the construction of an instrument.

When it happens that there is a great disparity between the numerator and denominator of a fraction, where only the larger of them admits of composite numbers, we must substitute *unity* for a composite number along with the other, and then increase both parts to get a train as before. As

an example of this kind, let us take $\frac{19}{235}$, the lunar num-

bers of Ferguson's calculator, which, though more accurate than those of his orrery, he has not attempted to reduce into smaller practical numbers: the numerator is a prime number, for which we may put 19×1 , and the de-

nominator is equal to 47×5 ; hence $\frac{19 \times 1}{47 \times 5}$, or $\frac{19}{47} \times \frac{1}{5}$,

will give us a train of $\frac{19}{47} \times \frac{10}{50}$, equal in value to $\frac{19}{235}$.

In order to produce the greatest possible velocity with the fewest teeth in a train, the ratio of each wheel to its pinion ought to be, says Dr. T. Young, in his Syllabus, nearly as 36 to 10.

Case 3.—In every instance where 1 or 2 stands in the place of a pinion, according to either Case 1, or Case 2, a single or double screw may be adopted instead of increasing both parts of the ratio, as has just been directed; but it must be under this limitation, that the screw be always the driver, otherwise the friction and indirect action

of the teeth upon its thread will prevent the communication of motion.

Case 4.—This case is more intricate than the preceding ones, and seems not to have been understood by any contriver of an orrery, except perhaps Ferguson and Janvier, whose orreries are free from both the defect and excess in the diurnal motion, which, one or other of them, render the tellurian and large orreries extremely imperfect.

When any given number of revolutions is to be produced in a wheel or pinion carried by a moveable arm or bar, during the time that the arm itself is carried once round a central driving wheel, a fraction consisting of the numbers of those two wheels, (whereof the central one must be the numerator, and the one driven by it on the bar the denominator,) must be added to, or subtracted from, the required number of revolutions, accordingly as the arm and the wheel borne by it have the directions of their motions circumstanced, and wheelwork must be calculated to effect the sum or difference, as the case may be: if the motions of the arm and of the wheel borne by it be in the *same* direction, the fraction must be *subtracted*, but if they be in *contrary* directions, the same must be *added*, before the proper wheels are calculated for the number thus obtained. As an instance of this species of calculation, let any central wheel be supposed to have 15 teeth, and the wheel borne by an arm moveable about it to have 10, and let us suppose that this latter wheel and the arm that supports it move in the *same* direction; then, under these circumstances, let two such other wheels be required to be calculated to actuate the central wheel, for the former portion of the train, as, in addition to those two, will produce just 15 revolutions of the last wheel 10, whilst the arm is going once round: in the first place, because the arm and the wheel 10 move both

in the *same* direction, $\frac{15}{10}$, or $1\frac{1}{2}$, must be *subtracted* from 15,

the number of revolutions required, which subtraction leaves $13\frac{1}{2}$; in the next place, because the central wheel of 15 goes only twice round for the wheel of 10, which is driven

by it three times, $\frac{2}{3}$ or $\frac{10}{15}$ of $13\frac{1}{2}$, which is equal 9, is the

value to be expressed by the fraction which is to represent the wheel and pinion required; $\frac{12}{108}$ therefore, or any pair

in a similar ratio, will be the wheel and pinion required; and the whole value, estimated by Case 4 under our last

head, will be thus expressed, $\frac{12}{108} \times \frac{10}{15} + \frac{15}{10} = 15$.

Again, let two such wheels be required as will produce the same number of revolutions while the arm and the wheel borne by it move in *contrary* directions, the numbers of the two given wheels remaining the same as before. Here

$\frac{15}{10}$, or $1\frac{1}{2}$, must be *added* to 15, which sum will be $16\frac{1}{2}$;

then $\frac{10}{15}$ or $\frac{2}{3}$ of $16\frac{1}{2}$ is 11, the value to be expressed by the

required wheels, which therefore may be $\frac{12}{132}$, producing

two more revolutions of the central wheel than was produced in the other instance; here the computation of the whole

value will be $\frac{12}{132} \times \frac{10}{15} - \frac{15}{10} = 15$.

Hence it appears, as was intimated before, that when a negative

negative sign is prefixed to the fractional portion, which consists of the central wheel for a numerator and the wheel on the arm for a denominator, in computing the number of revolutions made by the latter in wheelwork already constructed, according to Case 4 of our last head, a positive sign must be here used in calculating what the wheelwork ought to be, and *vice versa*; for as $4 + 2 = 6$, so $6 - 2 = 4$, the one case being just the converse of the other. Also, whenever the two wheels, which compose the fraction just specified, are of equal numbers, *unity* must invariably be added or subtracted, accordingly as the arm and wheel borne by it are circumstanced with respect to the direction of their motions.

Case 5.—When an apparent progressive motion is to be produced by the difference of two comparative motions in wheelwork, reduce the given period into its lowest denomination of time, and put it into a simple fraction in its lowest terms, which, if the motion is to be slower than the period of which it is a fraction, will be an improper fraction: then let the numerator be the *driven* wheel, and the *difference* between the numerator and denominator the *driver*; for instance, if $9\frac{1}{2}$ years were the period in which an index is required to advance progressively round the little ecliptic of an orrery or tellurian, whilst the ecliptic itself is moving backward once in a year to preserve its parallelism; in the

first place $9\frac{1}{2}$, reduced into a simple fraction, gives $\frac{59}{6}$, which would be the proper wheels, by Case 1, if the graduated ecliptic were not placed on a revolving arbor, but in this

case $\frac{59}{59-6}$, or $\frac{59}{53}$, will be the wheels required.

If it should so happen that a pair of wheels thus acquired should be too large to be conveniently constructed, they may be converted into a train of the same value by the directions laid down in the second case of this head.

Case 6.—When we are to exhibit an apparent retrograde motion by the difference of two unequal motions, in a given period, let this period be reduced into a simple improper fraction, as in the last case, and then the numerator, as before, will be the *driven* wheel; but here the *sum* of the numerator and denominator will be the *driver*, so that if $9\frac{1}{2}$ were the period as before, the wheels would be equal to $\frac{59}{59+6}$,

namely $\frac{59}{65}$. In this case also a train may be constituted of two wheels which are in themselves too large for use.

Case 7.—When the parallelism of a wheel's axis is to be preserved in every part of the revolution of the arm that bears it, nothing more is necessary than to make the wheel revolve by any contrivance *exactly once* in each revolution of the arm, but in a *contrary* direction, as has been already explained in Case 7 of our last head.

It may here be acceptable to the instrument maker to learn how, from one or other of these seven cases, any wheel or portion of a train, which has been mislaid or lost, may be replaced.

As it is always known what period of time is *intended* to be represented by any particular train in every instrument, the general rule will be, to ascertain, first by the proper case in our last head, what the value is, in time, of that portion of the train which remains, and then divide the whole known period by this value, and the quotient will represent the value of the deficient portion to be replaced by the corresponding case in this head.

For an example of this kind we may take the annual train of the old astronomical clock at Hampton Court, in the calliper of which we have seen that two deficient wheels are represented by dotted circles, which are said to have been somehow supplied by a man of the name of Lang. Bradley of Fenchurch-street, but in what manner is not related: in our notice of this clock we put down the whole

train thus, $\frac{*}{8} \times \frac{29}{*} \times \frac{132}{12}$, out of which we may take $\frac{29}{8} \times \frac{132}{12} = \frac{3828}{96}$, or 39.875 for the value in days of the

entire portion; and if the whole year 365.24222 be divided by 39.875, the quotient 9.15943 will express the value of the two deficient wheels, or wheel and pinion, which we now have to ascertain. We find, by either of two modes of calculation, which will be presently described and illustrated, that the value of the decimal portion, 15943, if expressed in vulgar fractions, will be, according to the accuracy we

may require, some one of these, *viz.* $\frac{1}{6}$, $\frac{3}{19}$, $\frac{4}{25}$, or $\frac{11}{69}$;

and the mixed numbers $9\frac{1}{6}$, $9\frac{3}{19}$, $9\frac{4}{25}$, and $9\frac{11}{69}$, when converted into simple ratios, will be respectively $\frac{55}{6}$, $\frac{174}{19}$,

$\frac{229}{25}$, and $\frac{632}{11}$; the most accurate of these of course is the

last, but is by no means of a practical size; in the calliper it appears that the wheel is a little larger than the one

marked 132, which circumstance points out that $\frac{174}{19}$ must

be the numbers to be adopted in order to supply the deficiency of the train before us: the whole train, however, is by no means so accurate as Ferguson's, who adopted for this construction of a clock the same train which he calculated for his orrery: according to Case 2 of our second head, the value of the whole train, thus supplied, will be

$\frac{174}{8} \times \frac{29}{19} \times \frac{132}{12} = \frac{666072}{1824} = 365^d 4^h 6^m 35^s.184$; and if a

more exact period be required to be represented, either one of the larger pairs must be used, or the whole train must be reformed.

If, however, we take 365 days for the year, which probably was the time intended, then we shall have as successive

fractions $\frac{55}{6}$, $\frac{64}{7}$, $\frac{119}{13}$, and $\frac{2920}{319}$, the last of which is the

exact fraction, but too large for wheelwork, on which

account, most likely, $\frac{119}{13}$ were the numbers, which makes

the whole movement $\frac{119}{8} \times \frac{29}{13} \times \frac{132}{12} = 365^d 0^h 13^m 50^s.7$.

By this method also a ratio may be formed of the periods of any two individual planets, and wheelwork calculated to communicate motion immediately from one to the other; or indeed *any time* may be assumed as the period of the *first mover* in an instrument, provided the wheelwork of all the planets are proper ratios of that period: in the common planetarium the period assumed is one year, but if, instead of this, a period which is nearly a mean between the two extreme periods of Mercury and Georgian, were substituted, then eleven pair of wheels, or wheels and pinions for the eleven primary planets, would be sufficient for the production

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tion of the eleven periods, more or less accurate, accordingly as the ratios consist of large or small numbers.

We shall hereafter shew how a mean period may be ascertained which will become a common denominator to the tropical periods of *all* the planets, used as numerators in *practical* numbers; and at the same time the most desirable numbers will be determined, for the construction of a simple planetarium, to represent all the mean motions accurately with the least possible number of wheels and pinions; but in order to arrive at great accuracy in all the periods, the numbers that compose the fractions will necessarily be large; for what is gained in simplicity, will, in a certain degree, be lost in accuracy.

Of incommensurable Numbers.—We have now explained the fundamental rules for determining wheelwork which shall correspond to any assumed *commensurable* period, the application of which can hardly be misapplied in the respective cases which occur in the practice of instrument makers; but when we come to apply them to ratios consisting of *prime* or *incommensurable* numbers, it becomes inevitably necessary to substitute other ratios of *nearly* the same value, for the true ratios themselves, and then to apply the preceding rules to those, which must consequently be *commensurable* ratios.

The readiest method of determining all the variety of approximate *small* ratios, though somewhat mechanical, is by means of two logarithmic lines for working proportions, which on the common sliding rules are marked A and B; for if the three first figures in the numerator of any fraction, vulgar or decimal, which consists of many places of figures on A, be set to the three first of its denominator on B, then every pair of coincident dividing or subdividing lines, examined like the index and limb of a Hadley's sextant, will constitute so many ratios, more or less exact, as the coincidences are more or less perfect; and if the graduated lines are of a large radius, and well graduated upon metal or seasoned wood, all the variety of approximate small ratios will be seen at one position of the slider, that can possibly be formed; after which their respective values may be ascertained, by converting them successively into decimals, and comparing them with the large original fraction.

This short method, however, ought not to be depended upon in calculations where great accuracy is required, for we can seldom come nearer the truth, in the fraction of a year, than as far as the second figure in decimals; whereas, the value of *seconds* depends generally upon the *fifth* and *sixth* decimal figures. In the fraction of a day or other short period, it is very useful as a check upon arithmetical calculations, and will sometimes even supersede the necessity of them. We might now proceed to determine, by a direct method, better known to mathematicians than artists, a series of continual fractions, which approximate to the truth the nearer the higher they run, and are alternately *above* and *below* the true ratio; but as a *new tentative* or *indirect method* occurred to the author of this article, which has its advantages, before he was acquainted with the application of the one alluded to, it may be deemed acceptable to some readers to see it exemplified in the first place.

Indirect Method of Approximation.—When none of the small fractions or ratios indicated by the sliding rule are sufficiently accurate, take one of them and increase both parts of it, by a common multiplier, and then *add unity* to, or *subtract unity* from that part, whether numerator or denominator, which is too great or too small for its correspondent, and by trying the value of the new enlarged fraction in decimals, it will be readily seen whether the multiplier assumed has been too large or too small; after which a second, and a third multiplier may be successively tried,

and it will soon appear what number is the most accurate multiplier to be adopted. The advantages of this method are these two principally; that its nature is easy to be apprehended without algebraical demonstration; and that it affords a great variety of ratios, differing from each other but little in value, out of which to select a proper practical or commensurable ratio; indeed instances have occurred, in which better practical trains have been procured by this method, than can be done by the more direct scientific method, which will be afterwards exemplified.

The Sun's Wheels.—As the sun is the grand luminary which, placed in, or at least near, the centre of the whole system, gives light and heat to the surrounding bodies, we will begin with the calculation of wheels proper for producing a rotation on his axis, and then proceed gradually to the revolutions of the planets in their respective order; the period of a rotation of the sun, as it respects the earth, has been given by La Lande, as we have seen above, at 25 days and 10 hours, or 25.41666 days, by which, if we divide 365.24222, we shall have 14.37008 rotations in a tro-

pical year; here $14\frac{37}{100} = \frac{1437}{100}$ is not to be divided lower

than $\frac{479 \times 3}{10 \times 10}$, on which account an approximate fraction

must be substituted for $\frac{37}{100}$; set, therefore, 37 on A to 100 on B, and the nearest small ratios constituted by the ap-

parently coincident lines will be $\frac{7}{19}$ and $\frac{10}{27}$, the latter of

which, converted into a decimal, makes .370370, &c. in which the variation from the truth is, as it happens, in the *fourth* figure of decimals. In this instance, as the solar spots seldom continue unchanged for more than two or three rotations of the sun, a more accurate ratio might seem quite

unnecessary, for $14\frac{10}{27} = \frac{388}{27}$, or rather $\frac{27}{388}$, as the mo-

tion to be produced is quick, is reducible into $\frac{27 \times 1}{97 \times 4}$, and

a train equal to this is $\frac{27}{97} \times \frac{15}{60} = 25^d 9^h 59^m 31^s$; but

to exemplify our method of approximating still nearer to the truth, let us take the $\frac{7}{19}$, and multiply both its parts by 10,

making $\frac{70}{190}$; now as $\frac{7}{19}$ is equal to .36842 only, the 19 is

too large for its numerator; let, therefore, unity be subtracted

from 190, and we shall have $\frac{70}{189} = .370370$, &c. the same

ratio as $\frac{10}{27}$; again, try 12 for a multiplier, and there will

be $\frac{12 \times 7}{12 \times 19 - 1} \} = \frac{84}{227} = .37004$, which is extremely

near the truth, but unfortunately $14\frac{84}{227}$ cannot be turned into a convenient train, by reason of 227 being a prime number; from these two trials, one of which gives more, and the other less than the true value, we now know, that if 11, used as a multiplier, will produce a commensurable ratio, it will be proper for our train; and if not, we must take 13, as the next nearest to 12, for the proper multiplier; accordingly

ingly $\frac{11 \times 7}{11 \times 19 - 1} = \frac{77}{208} = .37019$ gives us $14\frac{77}{208} = \frac{2989}{208}$, and when this is inverted, we shall have a train of

$\frac{49}{16} \times \frac{61}{13} = 25^d 9^h 59^m 56^s.995$, in which time the error is little more than three seconds. If it had become necessary to use 13 as a multiplier instead of 11, the process

would have been $\frac{13 \times 7}{13 \times 19 - 1} = \frac{91}{246} = .36992$ nearly;

and $14\frac{91}{246} = \frac{91}{3535}$, when inverted, will afford the train

$\frac{6}{101} \times \frac{41}{35}$, the value of which is $25^d 10^h 0^m 4^s$, in which the error is only four seconds in the opposite extreme.

In determining what high numbers are commensurable, when a table of primes is not at hand, try first 2 and 5 as divisors, and then the primes 3, 7, 11, 13, 17, 19, 23, &c. successively, if they are indivisible by 2 or 5, until a prime number is arrived at as large as the square root of the number examined, and if none of these will divide it without a remainder, the high number is itself a prime number, and therefore inapplicable to mechanical purposes.

Wheels for the tropical Revolution of Mercury.—After having given a detailed account of the application of our indirect method of approximation, in determining a train for the sun's rotation, it will be unnecessary to be so minute in particularizing the whole process in the examples which follow.

The tropical period of Mercury, as we have seen, is $87^d 23^h 14^m 35^s.2$, or makes 4.151967, &c. revolutions in a tropical year. Now if 152 on A be put to 1000 on B,

on the sliding rule, we shall have the ratios $\frac{5}{33} = 1515$,

$\frac{7}{46} = 1521$, &c. and $\frac{12}{79} = 1519$, as nearly as possible.

The last of these three ratios is capable of forming a train

equal to $\frac{79}{328}$, namely, $\frac{12}{96} \times \frac{79}{41} (= \frac{79}{8 \times 41})$, which pro-

duces an error of only $2^m 6^s$ too much in a revolution. But exact as this train is, compared with the trains of instruments in general, our method of approximation will procure us a much more accurate one. Let us take the first

ratio, $\frac{5}{33}$, for this purpose: the wheels composed of $43\frac{5}{33}$

are $\frac{33}{137}$; and as 33 is too large for the 5, unity must be

added to the 137. After both parts are multiplied an equal number of times, this multiplier we find by a few

trials to be 67; so that $\frac{33 \times 67}{137 \times 67 + 1} = \frac{2211}{9180} = 4.15196$

&c. gives us a very convenient train of $\frac{11}{90} \times \frac{67}{34}$

($= \frac{33 \times 67}{102 \times 90}$), the value of which is $87^d 23^h 14^m 35^s.796$,

in which the error in a whole revolution is little more than half a second.

Wheels for the tropical Revolution of Venus.—The tropical revolution of Venus has been ascertained to be $224^d 16^h 41^m 30^s$; according to which data, this planet will make 1.625498, &c. revolutions in a solar year. Now the nearest small fraction, which corresponds to the decimal portion, is $\frac{5}{8} = 625$ exactly, and the ratio $\frac{8}{13} = 1\frac{5}{13}$ inverted, is

the same ratio which was used for Venus in Huygens' automaton, and the instruments copied from it. But these numbers are by no means sufficiently correct for an instrument of great accuracy; they must consequently be brought, by our approximating process, into higher numbers suitable for a train. The numerator of this fraction being too large for its denominator, let us assume 312 for a multiplier, and add unity to the denominator; for the more accurate the small fraction is already, the greater will the multiplier be required to be, and *vice versa*: thus we shall have $\frac{8 \times 312}{13 \times 312 + 1}$

$= \frac{2496}{4057} = 1.6254006$. Again, this multiplier proving to be too great, let us try 305 instead, from which we shall

have $\frac{8 \times 312}{13 \times 312 + 1} = \frac{2440}{3966} = 1.625409$, &c. which is

a little nearer. The former of these periods is equal to $224^d 17^h 1^m 0^s$, and the latter to $224^d 16^h 59^m 10^s.2$: now the difference of those two periods being about 2^m , and the difference of the multipliers 7, we can, from these two trials, ascertain pretty nearly what number will be a proper multiplier; for as 2^m are to 7, the difference of the multipliers, so are 17^m , the whole remaining error, to 59, the number to be subtracted from 305, upon a presumption that the decreasing intervals of time are in direct proportion; 246, therefore, is the multiplier for our third trial, from which we gain a period, where the error is much less, and of an opposite denomination. In order now to gain a great variety, from which to select an accurate practical train, we will subjoin a table of ratios, with their values attached, till we arrive at the truth as nearly as may be.

TABLE of Ratios for the Train of Venus.

Process.	Ratios.	Values.
$\frac{8 \times 246}{13 \times 246 + 1}$	$= \frac{1968}{3199}$	$= 1.625508$.
$\frac{8 \times 247}{13 \times 247 + 1}$	$= \frac{1976}{3212}$	$= 1.625506$.
$\frac{8 \times 248}{13 \times 248 + 1}$	$= \frac{1984}{3225}$	$= 1.625504$.
$\frac{8 \times 249}{13 \times 249 + 1}$	$= \frac{1992}{3238}$	$= 1.625502$.
$\frac{8 \times 250}{13 \times 250 + 1}$	$= \frac{2000}{3251}$	$= 1.625500$.
$\frac{8 \times 251}{13 \times 251 + 1}$	$= \frac{2008}{3264}$	$= 1.625498$.
$\frac{8 \times 252}{13 \times 252 + 1}$	$= \frac{2016}{3277}$	$= 1.625496$.
$\frac{8 \times 253}{13 \times 253 + 1}$	$= \frac{2024}{3290}$	$= 1.625494$.

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Process.	Ratios.	Values.
$\frac{8 \times 254}{13 \times 254 + 1}$	$\frac{2032}{3303}$	$= 1.625492.$
$\frac{8 \times 255}{13 \times 255 + 1}$	$\frac{2040}{3316}$	$= 1.625490.$
$\frac{8 \times 256}{13 \times 256 + 1}$	$\frac{2048}{3329}$	$= 1.625488.$
$\frac{8 \times 257}{13 \times 257 + 1}$	$\frac{2056}{3342}$	$= 1.625486.$
$\frac{8 \times 258}{13 \times 258 + 1}$	$\frac{2064}{3355}$	$= 1.625484.$

In this table, each ratio differs in value from the next preceding, on an average, about $24''$ of time, and $\frac{2008}{3264}$ is the most exact, the error in it being scarcely perceptible: it is not, however, reducible into the form of a practical train; but $\frac{2016}{3277}$, the next in accuracy, which varies from the truth only 2 in the *sixth* place of decimals, is convertible into the train $\frac{32}{113} \times \frac{63}{29}$, the value of which is $224^d 16^h 43^m 1^s$.

Besides this train, the ratio $\frac{1984}{3225}$ affords the train $\frac{32}{75} \times \frac{62}{43} = 224^d 16^h 40^m 25^s$; and the ratio $\frac{2064}{4355}$, which is the least exact, is convertible into $\frac{48}{55} \times \frac{43}{61} = 224^d 16^h 44^m 18^s$, in which the error is only $2^m 48^s$ in the whole period. Indeed, many other ratios might be procured by this process, varying only a few minutes from the truth, if the table were extended; but as the most accurate will always be preferred, we have carried it to a sufficient length.

The trains, which have been ascertained from the preceding table, are calculated upon a supposition that the wheels will all be placed on a stationary support; but as Venus revolves next to the Earth, in the solar system, the writer of this article has found it convenient, in an orrery which he has constructed, to place some of the wheels on the Earth's annual arm; in which construction, Venus is carried once round in every tropical year, independently of the simple operation of the train, in the same way that Mercury is carried once by the arm of Venus, in Ferguson's orrery, in every revolution of the latter. This mode of placing the wheels requires that the numerator of the simple fraction,

$\frac{2016}{3277}$, already adopted as the most accurate, should remain

as it is; but that the difference between the numerator and denominator be made a new denominator, by which means

unity is ejected, and $1 + \frac{2016}{1261}$, instead of $1 \frac{2016}{1261}$, becomes

the representative formula, and the value of the train =

$0.625496; \frac{2016}{1261}$, however, is capable of forming the train

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$\frac{63}{13} \times \frac{32}{97}$, and $1 + \frac{63}{13} \times \frac{32}{97}$ is equal to $214^d 16^h 42^m 1^s$, as before.

The ratio $\frac{2016}{1261}$ might otherwise have been acquired by

taking $\frac{8}{5} = 625$, instead of $\frac{8}{13}$, or $\frac{13}{8} = 1.625$, before the

approximation; for $\frac{8 \times 252}{5 \times 252 + 1} = \frac{2016}{1261}$ is the same

result as by the former process. For other calculations of this sort, see PLANETARIUM.

Train for the Earth's annual and diurnal Motions.—The earth's diurnal rotation and annual revolution, taken jointly, constitute the standard of our measure of time, and is always referred to, not only when we speak of historical facts, but when we describe the revolutions and rotations of all the other planets; it is therefore of the utmost importance, in an astronomical instrument, that the train, which consists of the ratio between a day and a year, be accurate. The solar year, as we have seen, consists of $365^d 5^h 48^m 48^s$, or, in another form, of 365.24222 days; the nearest fraction to re-

present the decimal portion 24222 exactly, is $\frac{109}{450}$, and

$365 \frac{109}{450} = \frac{164359}{450}$ are divisible into $\frac{269}{10} \times \frac{47}{9} \times \frac{13}{5}$,

which numbers constitute a movement for the *truth itself*. If, however, we wish to substitute an approximate ratio of as nearly an equal value as we can obtain for smaller numbers than 269; the small fraction suitable to approximate from

is $\frac{8}{33} = 2424$, and the nearest multiplier is 35; for 365

$\frac{8 \times 35}{33 \times 35 \times 1} = \frac{1156}{422220}$ is reducible into $\frac{4}{227} \times \frac{17}{60}$

$\times \frac{17}{31}$, the time corresponding to which is $365^d 5^h 48^m$

$47^s.3$, which will be allowed to be exact enough for the nicest purposes, as the error in a year does not amount to three quarters of a second.

The numerator 4, it will be observed, is too small a number for a pinion to consist of, for which reason let it be doubled, and also the 31 among the denominators or drivers,

by which alteration we shall have a practical train of $\frac{8}{227} \times$

$\frac{17}{62} \times \frac{17}{60}$. Here the large wheel of 227 will be suitable for

the fixed wheel in an orrery or tellurian, where the rest of the train is placed on the annual arm, and carried round it; or for what is called the annual wheel in any orrery where all the wheels revolve in fixed situations.

Wheels for the tropical Revolution of Mars.—Next in the system beyond our earth revolves the planet Mars, finishing its course through the ecliptic in $686^d 22^h 18^m 37^s$, according to our calculations from La Lande's last tables, which time bears the same proportion to a solar year that 1.880750 does

to 1. In this example the small fraction will be $\frac{47}{25} = 1.88$,

and 53 the nearest multiplier, as may be seen from the subjoined table.

E c

TABLE

TABLE of the Ratios of Mars.

Procefs.	Ratios.	Values.
$\frac{47 \times 52 + 1}{25 \times 52}$	$\frac{2445}{1300}$	$= 1.880769$
$\frac{47 \times 53 + 1}{25 \times 52}$	$\frac{2492}{1325}$	$= 1.880754$
$\frac{47 \times 54 + 1}{25 \times 54}$	$\frac{2539}{1350}$	$= 1.880740$

Fortunately $\frac{2492}{1325}$, the most accurate of these three ratios,

admits of the practical train $\frac{89}{25} \times \frac{28}{53} = 686^d 22^h 20^m$

$41^s.19$; in this train the error is $2^m 41^s.19$, or a space in the ecliptic of $3\frac{1}{2}''$, which may be considered nearly as accurate at any of the preceding; for during a revolution of Mercury it will only be about an eighth part of this quantity; an error of a few minutes in the revolutions of the superior planets being less perceptible than in the inferior ones, both on account of the slowness of their mean motions, and the great length of their tropical periods; for one minute's motion of Mercury in the ecliptic is $10''.2$, which exactly corresponds to *two hours* motion of Saturn, and $5^h.69$ of the Georgian planet.

Wheels for the tropical Revolutions of the four little Planets lately discovered.—According to the best information we at present possess, the periods of the four newly discovered planets, as they relate to the ecliptic, are these; viz. that of Vesta in 3.655153 tropical years; that of Juno in 4.355282 , that of Ceres in 4.603056 , and that of Pallas in 4.603616 ; but those of the two last named are so nearly alike, that a mean between the two may be taken at 4.603386 , in order to make one pair of wheels, or one train, produce the revolutions of both planets.—By the aid of the sliding

rule we find the nearest small fraction for Vesta to be $\frac{19}{29}$

$.65517$; and $3\frac{19}{29} = \frac{106}{29}$ will constitute the wheels proper

to produce a revolution in 3.65517 tropical years, or in 1335.02329 days. In like manner for Juno the smallest frac-

tion is $\frac{11}{31} = .35484$; and $4\frac{11}{31} = \frac{135}{31}$ will be proper

wheels for a revolution to be performed in 4.35484 tropical years, or in 1590.56774 days. Likewise for Ceres and

Pallas, the fraction $\frac{3}{5} = .60$ will be the nearest in small

terms, and $4\frac{3}{5} = \frac{23}{5}$, or in a more practical form, $\frac{138}{30}$ will

be wheels proper for effecting a mean of the two revolutions, and two arms opening like a pair of dividers may be inserted on a tube connected with wheel 138, when the 30 revolves in a solar year, in which case each planet will make a revolution in the ecliptic in 4.60 tropical years, or in 1680.11421 days.

We might approximate much nearer to the assumed periods of these planets by our process for gaining trains, but until the periods themselves are more nicely determined, it would answer no useful purpose.

Wheels for the tropical Revolution of Jupiter.—We come

next to Jupiter, which planet, we have seen, runs through the ecliptic, according to La Lande's tables, in $4330^d 14^h 40\frac{1}{2}^m$, or in 4330.61145 days, which number divided by 365.242222 gives the same equal to 11.856820 tropical years;

now if we take $\frac{6}{7}$ for the small fraction, and 377 for the

nearest practical multiplier, we shall have $\frac{6 \times 377}{7 \times 377 + 1} =$

$\frac{2260}{2640} = .856818$; and $11\frac{2260}{2640}$, or $\frac{31302}{2640}$, may be re-

solved into $\frac{141 \times 222}{33 \times 80}$, which, if we take two-thirds of

each leading portion, and one-half of each following, in both the numerator and denominator, will afford us the con-

venient train $\frac{111}{22} \times \frac{94}{40}$, the value of which is $4330^d 14^h 39^m$

5^s , during which time the error in time is only $1^m 25^s$, or a corresponding space in the ecliptic equal to a *quarter* of a *second*.

Wheels for the tropical Revolution of Saturn.—We come now to ascertain wheels proper for the tropical revolution of Saturn, which, by the best tables of La Lande, is equal to $10746^d 19^h 20^m$, or 29.423777 tropical years; the several small fractions which the sliding rule gives, nearly equal

to the decimal portion $.423777$, are $\frac{3}{7} = .428$, &c.; $\frac{11}{26}$

$= .4230$, &c.; $\frac{14}{33} = .424242$; and $\frac{25}{59} = .423728$: now,

if we approximate from the first of these, we shall have the following ratios.

Procefs.	Ratios.	Values.
$\frac{3 \times 16}{7 \times 16 + 1}$	$\frac{48}{113}$	$= .4247$
$\frac{3 \times 15}{7 \times 15 + 1}$	$\frac{45}{106}$	$= .4245$
$\frac{3 \times 14}{7 \times 14 + 1}$	$\frac{42}{99}$	$= .424242 = \frac{14}{33}$ the third fraction.
$\frac{3 \times 13}{7 \times 13 + 1}$	$\frac{39}{92}$	$= .423913$
$\frac{3 \times 12}{7 \times 12 + 1}$	$\frac{36}{85}$	$= .4235$

These values are not exact enough here, and the numbers $29\frac{1}{2}$, which are the most accurate, have prime numbers for the factors of their denominator, when reduced into a sim-

ple fraction; we must therefore have recourse to $\frac{11}{26}$, the

second small fraction for constructing another table of ratios, thus:

Procefs.	Ratios.	Values.
$\frac{11 \times 25}{26 \times 25 - 1}$	$\frac{275}{649}$	$= .42372$
$\frac{11 \times 24}{26 \times 24 - 1}$	$\frac{264}{623}$	$= .42375$

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Process.	Ratios.	Values.
$\frac{11 \times 23}{26 \times 23 - 1}$	$\frac{253}{597}$	$= .42378$
$\frac{11 \times 22}{26 \times 22 - 1}$	$\frac{242}{571}$	$= .42381$
$\frac{11 \times 21}{26 \times 21 - 1}$	$\frac{231}{545}$	$= .42385$
$\frac{11 \times 20}{26 \times 20 - 1}$	$\frac{220}{519}$	$= .42389$
$\frac{11 \times 19}{26 \times 19 - 1}$	$\frac{209}{493}$	$= .42393$
$\frac{11 \times 18}{26 \times 18 - 1}$	$\frac{198}{467}$	$= .42398$
$\frac{11 \times 17}{26 \times 17 - 1}$	$\frac{187}{441}$	$= .42403$
$\frac{11 \times 16}{26 \times 16 - 1}$	$\frac{176}{415}$	$= .42409$
$\frac{11 \times 15}{26 \times 15 - 1}$	$\frac{165}{389}$	$= .42416$
$\frac{11 \times 14}{26 \times 14 - 1}$	$\frac{154}{363}$	$= .42422 = \frac{14}{33}$ as before.

The most accurate ratio of this table is $\frac{253}{597}$, but $29\frac{253}{597}$

is incapable of becoming a practical train when reduced into a simple fraction, one of the factors of the numerator being

the large prime 8783, the next in accuracy is $29\frac{18341}{623}$,

which is not reducible into numbers low enough for a train; and $29\frac{18341}{623}$ is also incapable of reduction, by reason of the denominator 571 being a prime number; but $29\frac{18341}{571}$ =

$\frac{19096}{649}$ is reducible into the train $\frac{124}{59} \times \frac{154}{11}$; the value of

which is $10746^d 18^h 54^m 51^s$; this train is of the same value as $29\frac{18341}{571}$, obtained from the sliding-rule alone, and may

otherwise be more conveniently expressed thus, $\frac{124}{7} \times \frac{98}{59}$.

Again, $29 \frac{231}{545} = \frac{16036}{545}$ will give us the less accurate

train $\frac{76}{109} \times \frac{211}{5}$, the value of which is $10746^d 20^h 0^m 17^s.26$.

Wheels for the tropical Revolution of the Georgian Planet.—We come, lastly, to the Georgian planet, which performs its circuit through the ecliptic in $30589^d 8^h 27^m$, if we confide in the accuracy of La Lande's tables, as calculated by La Lambre; let now 30589.35208 be divided by 365.24222 , and we shall have 83.750865 tropical years for the length of the same period, which happens to be so nearly $83\frac{1}{4}$, or

$\frac{335}{4}$, that an approximation seems unnecessary: the train

answering to this fraction may be $\frac{67}{10} \times \frac{100}{8} = 30589^d$

$0^h 52^m 0^s$, which time is so near the period assigned by the tables, that the error in space is only about $14''$ in the whole revolution.

These examples will suffice to shew the application of this mode of approximation in any calculation of wheelwork that may occur in the practical construction of an instrument, though, it must be confessed, the following method is more concise, as well as more strictly mathematical, and therefore will generally be preferred by those who understand it, and who may have occasion to make new calculations for wheelwork.

It was deemed expedient to exemplify both methods, in order that, when one will not produce a convenient train, in any instance, the other may supply its defect if possible.

Direct Method of Approximation.—The method, already alluded to, of determining a series of ratios, alternately above and below the value of a given incommensurable ratio, has been treated of by a great variety of writers in different languages. [Vide Descriptio Automati Planetarii, Huygens. The Description and Use of an Orrery of a New Construction, Martin. Complement des Elemens d'Algebre, S. F. La Croix. Introductio in Analysin Infinitorum, Euler. Opuscula Analytica, Euler. Elements of Algebra, vol. ii. Euler. La Resolution des Equations Numeriques, La Grange. Theorie des Nombres, Le Gendre. Memoires de l'Academie des Sciences de Paris, 1772. Memoires de l'Academie de Berlin, 1767, 1768, 1769, and 1776. Memoires de l'Academie de Petersbourg, 1779. Cahier du Journal de l'Ecole Polytechnique, 52. Hutton's Tracts. Vince's Astronomy. Biot's Astronomy, &c.]

This method is attributed to Cotes as the inventor; but Huygens and Martin are the only two authors, perhaps, who have applied it to the calculation of wheelwork to represent the periods of the planetary motions: they were not, however, in possession of periods quite so accurate as the present tables afford for the data of their calculations, and by giving only the theory and result of their method, instead of the arithmetical process at full length, have puzzled the artist, and left him at a loss how to proceed in the practical application of rules which have not been sufficiently exemplified: indeed, the fifteen theorems of Martin, which were intended to illustrate, by algebraical expressions, the theory of determining a converging series of ratios, have deterred the instrument maker, who is unacquainted with algebra, from entering upon calculations which carry with them the appearance of intricacy.

We shall, therefore, divest the method of approximation, which is the subject of our present chapter, of algebraical characters, and shall endeavour to render it intelligible by a succession of examples, such as were adopted in the last chapter, and shall distinguish it from the preceding indirect method, by calling it the *direct* method of approximation.

General Rule.—1. Reduce the periods of the two heavenly bodies which have their velocities compared, into the same denomination, by either vulgar or decimal arithmetic, and draw a line between them for the *true ratio*, or *unreduced fraction*.

2. Divide the greater by the smaller part of this ratio, and note the quotient; then make the divisor a new dividend, and the remainder a new divisor, to procure a second quotient; and continue the same process until seven or eight quotients are obtained, according to the common rule of obtaining a common measure in vulgar fractions.

3. Put 9 for the first ratio, and $\frac{1}{9}$ for the second, and all the succeeding ones may be obtained from the successive quotients; thus, multiply by the first quotient the numerator of the ratio last obtained, and add to the product the numerator of the next preceding ratio, and this will be the numerator of a *new* ratio to follow; do the same with the denominators of the last and next preceding ratios for the denominator of the same new ratio; and continue this process till ratios are constituted of all the quotients in their

due succession, and these will be a series of ratios, alternately above and below the value of the original true ratio, converging towards the truth in proportion generally as the ratios are more or less numerous.

The praxis is extremely easy, and those readers who wish for a demonstration of the theory may consult the authors to whom a reference has been given, who have treated the subject mathematically.

In the examples of the sun's rotation, and of the primary planets which follow, a solar year, as before, will be taken as the standard period, with which the other periods will be compared, to constitute the true ratios, by which means we shall, as we proceed, contrast the two methods of approximation.

The Sun's Wheels.—The true ratio between a solar year and the revolution of the sun on its axis, as it regards the earth, is 25.41666 : 365.24222, or $\frac{365.24222}{25.41666}$, from which we have the annexed

Process for the Sun's Rotation.

Divisors.	Dividends.	Quotients.	Formulae.	Ratios.
				$\frac{0}{1}$
				$\frac{1}{0}$
				$\frac{1}{0}$
25.41666	365.24222 2541666 11107562 10.66666	14	$14 \times 1 + 0$ $14 \times 0 + 1$	$\frac{14}{1}$
940896	2541666 1881792	2	$2 \times 14 + 1$ $2 \times 1 + 0$	$\frac{29}{2}$
659874	940896 659874	1	$1 \times 29 + 14$ $1 \times 2 + 1$	$\frac{43}{3}$
281022	659874 562044	2	$2 \times 43 + 29$ $2 \times 3 + 2$	$\frac{115}{8}$
97830	281022 195660	2	$2 \times 115 + 43$ $2 \times 8 + 3$	$\frac{273}{19}$
85352	97830 85352	1	$1 \times 273 + 115$ $1 \times 19 + 8$	$\frac{388}{27}$
12468	85352 74808	6	$6 \times 388 + 273$ $6 \times 27 + 19$	$\frac{2601}{181}$
10554	12468 10554	1	$1 \times 2601 + 388$ $1 \times 181 + 27$	$\frac{2989}{208}$

As the last ratio of the series is in every instance the most accurate in the series, let it be examined, first, by a table of primes, as the ratios were in the preceding chapter, and if it is found to consist of a prime number in either of its parts, or to have a high prime for one of its factors, try the preceding ratio, or otherwise substitute another quotient next in value to the one used in the formula, for instance, either unity above it, or unity below it, and try if the ratio so

procured be a practical or divisible one; but this substitution must only be made with the *last* quotient, and that when carried to eight successive places; if, indeed, the numbers do not run too high, nine or ten quotients may be procured, and as many formulæ, but that extension will seldom be found to be necessary, unless one of the parts of the true ratio, which is the ground-work of the process, consist of more than eight figures; for it should seem that there ought to be as many quotients as there are figures in the greater portion of the true ratio, in order that the value of the last figure may

be involved. In the example before us, the last ratio, $\frac{2989}{208}$, is the same as was obtained by our indirect method of approximation, and is capable of constituting the train $\frac{13}{49} \times \frac{16}{61}$, the value of which has been shewn to be $25^d 9^h 59^m 56^s.995$.

The reason why the ratio is here inverted, is, that the sun's rotation is the shorter period, and is to be considered as the *driven* portion of the train. The next preceding

ratio, $\frac{2601}{181}$, consists not of practical numbers; but $\frac{388}{27}$, the last but two, proves also to be the same as was procured by the sliding rule for the train $\frac{27}{97} \times \frac{15}{60} = 25^d 9^h 59^m 31^s$.

It will have been observed, that the recurring decimal figures, beyond the fifth place, have been neglected in the tabular process, it having been considered that the value so excluded is too inconsiderable to be regarded, particularly as the last ratio proves to be commensurable in both its parts.

Should it ever hereafter be found, that the same solar spots, as they were formerly called, (but which Dr. Herschel now denominates *openings* in the solar atmosphere, which accompany the sun's rotation,) have periodic re-appearances, the series of ratios before us will be of service for establishing the existence of such re-appearances, and will afford data for the construction of tables to predict

their occurrence. If, for instance, we take the ratio $\frac{115}{8}$,

it implies, that in eight years the sun has 115 rotations; for $365\frac{1}{4} \times 8$ are equal to 2992 days, also 25.416×115 produce 2922.916, so that after a lapse of eight civil years, in which are two bissextiles, the same spot would be visible on the same part of the sun on the same day of the same month, provided it either continued so long, or re-appeared identically: in 19 years there would be more exactly as to the hour of the day 273 rotations; in 27 years the same occurrence would happen more accurately after 388 rotations; after 181 years the number of rotations would be 2601 very nearly; and lastly, after the lapse of 208 years, the deviation from the original situation both as to time and appearance, would not amount to an hour, provided the civil years are made solar ones by the omission of two bissextiles in the two centuries, for 365.24222×208 are equal to 75970.382 days, and also 25.41666×2989 are equal to 75970.416, in which periods the difference is only $48^m 57^s.6$.

Wheels for Mercury's tropical Revolution.—We have already seen that the proportion of velocity between the Earth and Mercury is as 1 to 4.151967, from which data we shall be enabled to determine an indefinite series of ratios according to the foregoing rule, as in the annexed

Process

NUMBERS.

Process for Mercury's tropical Revolution.

Divisors.	Dividends.	Quo- tients.	Formulae.	Ratios.
				$\frac{0}{1}$
1.000000	4.151967 4000000	4	$\frac{4 \times 1 + 0}{4 \times 0 + 1}$	$\frac{4}{1}$
151967	1000000 911802	6	$\frac{6 \times 4 + 1}{6 \times 1 + 0}$	$\frac{25}{6}$
88198	151967 88198	1	$\frac{1 \times 25 + 4}{1 \times 6 + 1}$	$\frac{29}{7}$
63769	88198 63769	1	$\frac{1 \times 29 + 25}{1 \times 7 + 6}$	$\frac{54}{13}$
24429	63769 48858	2	$\frac{2 \times 54 + 29}{2 \times 13 + 7}$	$\frac{137}{33}$
14911	24429 14911	1	$\frac{1 \times 137 + 54}{1 \times 33 + 13}$	$\frac{191}{46}$
9518	14911 9518	1	$\frac{1 \times 191 + 137}{1 \times 46 + 33}$	$\frac{328}{79}$
5393	9518 5393	1	$\frac{1 \times 328 + 191}{1 \times 79 + 46}$	$\frac{519}{125}$
4125	5393 4125	1	$\frac{1 \times 519 + 328}{1 \times 125 + 79}$	$\frac{847}{204}$
1268	4125 3804	3	$\frac{3 \times 847 + 519}{3 \times 204 + 125}$	$\frac{360}{737}$

We have here been able to advance as far as to ten quo-
tients before the numbers became too high, and yet the last
ratio, $\frac{360}{737}$, or by inversion $\frac{737}{360}$, is the same as $\frac{2211}{9180}$,
which was procured by our indirect method of approxima-
tion, and which affords the convenient, as well as very ac-
curate train, $\frac{11}{90} \times \frac{67}{34} = 87^d 23^h 14^m 35^s.726$.

If, instead of adopting the ratio of velocity $\frac{4.151967}{1000000}$, we
had used the fraction consisting of the tropical periods reduced
into minutes and decimals of a minute thus, $\frac{525948.800}{126674585}$, the
same quotients, and, consequently, the same train would
have been produced as we have here obtained.

From this series of ratios we see that, after the lapse of
737 years, the Earth, Sun, and Mercury, will be in the
same relative situation with respect to each other in the
ecliptic, that they were at the beginning of that period,
and will be nearly so in the years 204, 125, 79, &c. after a
given time, but less accurately as to the time of the day, the
smaller the number of years denominated in the series.

Wheels for the tropical Revolution of Venus.—If we reduce
the solar year and tropical period of Venus into minutes,
the true large ratio constituted of these numbers will be
 $\frac{525948.8}{323561.5}$, from which we shall have the following process
of approximation :

Process for the tropical Revolution of Venus.

Divisors.	Dividends.	Quo- tients.	Formulae.	Ratios.
				$\frac{0}{1}$
				$\frac{1}{1}$
				$\frac{1}{0}$
323561.5	525948.8 3235615	1	$\frac{1 \times 1 + 0}{1 \times 0 + 1}$	$\frac{1}{1}$
2023873	3235615 2023873	1	$\frac{1 \times 1 + 1}{1 \times 1 + 0}$	$\frac{2}{1}$
1211742	2023873 1211742	1	$\frac{1 \times 2 + 1}{1 \times 1 + 1}$	$\frac{3}{2}$
812131	1211742 812131	1	$\frac{1 \times 3 + 2}{1 \times 2 + 1}$	$\frac{5}{3}$
399611	812131 399611	2	$\frac{2 \times 5 + 3}{2 \times 3 + 2}$	$\frac{13}{8}$
12909	399611 38727	30	$\frac{30 \times 13 + 5}{30 \times 8 + 3}$	$\frac{395}{243}$
12341	12909 12341	1	$\frac{1 \times 395 + 13}{1 \times 243 + 8}$	$\frac{408}{251}$
568	12341 1136	21	$\frac{21 \times 408 + 395}{21 \times 251 + 243}$	$\frac{8963}{5514}$
	981 568			
413	568 413	1	$\frac{1 \times 8963 + 408}{1 \times 5514 + 251}$	$\frac{9371}{5765}$

In the series of ratios here obtained the three last are in-
capable of forming factors proper for the numbers of a train,
and $\frac{395}{243}$, the value of which is $224^d 16^h 38^m 22^s.2$, is the
same that Martin says he availed himself of in his "Orrery of a
new Construction;" the train into which it is reducible may
be $\frac{81}{20} \times \frac{12}{79}$.

In this example it appears the indirect method of approxi-
mation gives us a more accurate practical train, than our
present method. Should we, however, substitute other quo-
tients for one of the two last in the table, a train of greater
accuracy might be procured, but perhaps not without a suc-
cession of trials.

In the denominators of these successive ratios we have
also the equal intervals in years, after which a conjunction
of Venus with the Sun, or any other particular phenomenon

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of a similar nature, will happen on the same day of the month, and even *hour*, if we take one of the most accurate ratios.

Train for the Earth's annual and diurnal Motions.—The annual and diurnal motions of the earth constitute the fraction or ratio $\frac{365.24222}{1.00000}$, from which we thus approximate :

Procefs for a solar or tropical Year.

Divifors.	Dividends.	Quo- tients.	Formule.	Ratios.
				$\frac{0}{1}$
				$\frac{1}{0}$
				$\frac{1}{0}$
1.00000	365.24222 36500000	365	$\frac{365 \times 1 + 0}{365 \times 0 + 1}$	$\frac{365}{1}$
24222	100000 96888	4	$\frac{4 \times 365 + 1}{4 \times 1 + 0}$	$\frac{1461}{4}$
3111	24222 21777	7	$\frac{7 \times 1461 + 365}{7 \times 4 + 1}$	$\frac{10592}{29}$
2444	3111 2444	1	$\frac{1 \times 10592 + 1461}{1 \times 29 + 4}$	$\frac{12053}{33}$
666	2444 1999	3	$\frac{3 \times 12053 + 10592}{3 \times 33 + 29}$	$\frac{46751}{128}$
444	666 444	1	$\frac{1 \times 46751 + 12053}{1 \times 128 + 33}$	$\frac{58804}{161}$
222	444 444	2	$\frac{2 \times 58804 + 46751}{2 \times 161 + 128}$	$\frac{164359}{450}$

By retaining the value of the recurring decimal throughout the procefs, we have obtained in this example a ratio equal to the truth itself, which is precisely the same as we before afcertained, namely, $\frac{164359}{450} = \frac{269}{10} \times \frac{47}{9} \times \frac{13}{5}$, which in a practical form will be better thus, by inverting the fraction $\frac{10}{269} \times \frac{9}{47} \times \frac{15}{39}$, or thus, $\frac{10}{269} \times \frac{10}{26} \times \frac{18}{94} = 365^d 5^h 48^m 48^s$.

If we take the last ratio but one, $\frac{58804}{161}$, we shall have the train $\frac{7}{241} \times \frac{23}{61} \times \frac{15}{60} = 365^d 5^h 48^m 49^s.192128$, &c. in which the largest wheel is somewhat more practicable, with respect to its number of teeth ; which movement proves to be the same that A. Janvier has employed in his famous sphere lately constructed at Paris.

A train, however, still more convenient in point of size, and probably more accurate than the latter, may be obtained by fubstituting unity for the last quotient 2, for the ratio $\frac{105555}{298}$, which is equal to $\frac{8}{227} \times \frac{17}{62} \times \frac{17}{60}$, the value of which, as has been before observed, is $365^d 5^h 47^s.3$.

Here the artist has his choice of three different calcula-

tions, any of which will be sufficiently accurate for any instrument whatever.

The last ratio in this series, viz. $\frac{164359}{450}$, points out what is the proper correction for our calendar, to make the solar and the civil years convertible into one another exactly, on a supposition that the year consists of $365^d 5^h 48^m 48^s$, agreeably to La Lande's determination. If we divide 164359 by 365, we shall have 450 civil years, and 109 days over, which circumstance proves that in every 450 solar years there ought to be neither more nor less than 109 leap years ; or, which is the same thing, in 900 solar years, there ought to be 218 leap years ; if, therefore, the leap year should be omitted at the end of each of *seven*, and retained at the end of each of *two*, out of every *nine centuries*, then the civil and solar years would become coincident at the termination of each ninth century, for $7 \times 241 + 2 \times 251 = 218$ exactly. The same result will arise thus ; if we take $11^m 12^s$, the difference between a solar and civil year, and multiply 900 thereby, the product will be just seven days, which shews that seven centenary leap years should be rejected in 900 years.

Wheels for the tropical Revolution of Mars.—If we reduce the tropical period of Mars, $686^d 22^h 18^m$, and also a solar year into minutes, we shall have the ratio $989178 : 525948.8$ to approximate from, thus ;

Procefs for the tropical Period of Mars.

Divifors.	Dividends.	Quo- tients.	Formule.	Ratios.
				$\frac{0}{1}$
				$\frac{1}{0}$
				$\frac{1}{0}$
				$\frac{1}{0}$
525948.8	989178.0 5259488	1	$\frac{1 \times 1 + 0}{1 \times 0 + 1}$	$\frac{1}{1}$
4632292	5259488 4632292	1	$\frac{1 \times 1 + 1}{1 \times 1 + 0}$	$\frac{2}{1}$
627196	4632292 4390372	7	$\frac{7 \times 2 + 1}{7 \times 1 + 1}$	$\frac{15}{8}$
241920	627196 483840	2	$\frac{2 \times 15 + 2}{2 \times 8 + 1}$	$\frac{32}{17}$
143356	241920 143356	1	$\frac{1 \times 32 + 15}{1 \times 17 + 8}$	$\frac{47}{25}$
98564	143356 98564	1	$\frac{1 \times 47 + 32}{1 \times 25 + 17}$	$\frac{79}{42}$
44792	98564 89584	2	$\frac{2 \times 79 + 47}{2 \times 42 + 25}$	$\frac{205}{109}$
8980	44792 35920	4	$\frac{4 \times 205 + 79}{4 \times 109 + 42}$	$\frac{899}{478}$
8872	8980 8872	1	$\frac{1 \times 899 + 205}{1 \times 478 + 109}$	$\frac{1104}{587}$
108	8872 8856	82		

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If 82, the tenth quotient, were involved in this example, the numbers would run too high for wheelwork, from which circumstance we may infer that the ratio 1104 : 587, procured from the ninth quotient, is very accurate; accordingly, on examination, we find it to be equal to $686^d 22^h 17^m 58^s.88$, in which period the error is little more than one second of time in defect; the denominator 587 of the fraction proves, however, to be a prime number; the denominator, too, of the preceding ratio is not divisible lower than 2×239 , though the numerator forms the factors 31×29 ; so that a train more convenient

than $\frac{31}{239} \times \frac{232}{16}$ cannot be obtained from this ratio, the value of which is $686^d 22^h 34^m 42^s$, in which time the error is much greater than in the train for this planet obtained by our indirect method of approximation. In this series of ratios, and also in all those of the superior planets that follow, the numerators of the respective fractions express the solar years, in which the same phenomena, or position, with respect to the Earth and Sun, or to any particular star in the heavens, will recur after a number of revolutions, expressed by the denominators respectively.

The Wheels for Vesta's tropical Revolution.—If we take the tropical revolution of this planet at 3.65515 tropical years, we shall have the subjoined result.

Process for Vesta's tropical Revolution.

Divisors.	Dividends.	Quotients.	Formulae.	Ratios.
				$\frac{0}{1}$
				$\frac{1}{0}$
100000	3.65515 300000	3	$\frac{3 \times 1 + 0}{3 \times 0 + 1}$	$\frac{3}{1}$
65515	100000 65515	1	$\frac{1 \times 3 + 1}{1 \times 1 + 0}$	$\frac{4}{1}$
34485	65515 34485	1	$\frac{1 \times 4 + 3}{1 \times 1 + 1}$	$\frac{7}{2}$
31030	34485 31030	1	$\frac{1 \times 7 + 4}{1 \times 2 + 1}$	$\frac{11}{3}$
3455	31030 27640	8	$\frac{8 \times 11 + 7}{8 \times 3 + 2}$	$\frac{95}{26}$
3390	3455 3390	1	$\frac{1 \times 95 + 11}{1 \times 26 + 3}$	$\frac{106}{29}$
65	3390 325 40	50		

In this example we have arrived at the same result as we did before by the sliding rule only; and the 7th quotient, 50, being large, shews, that if it should be involved, the numbers would run higher than our present knowledge of the length of the period warrants.

Wheels for the tropical Revolution of Juno.—Taking Juno's tropical period at 4.35528 tropical years, we shall have the following ratios.

Process for Juno's tropical Revolution.

Divisors.	Dividends.	Quotients.	Formulae.	Ratios.
				$\frac{0}{1}$
				$\frac{1}{0}$
100000	4.35528 400000	4	$\frac{4 \times 1 + 0}{4 \times 0 + 1}$	$\frac{4}{1}$
35528	100000 71056	2	$\frac{2 \times 4 + 1}{2 \times 1 + 0}$	$\frac{9}{2}$
28944	35528 28944	1	$\frac{1 \times 9 + 4}{1 \times 2 + 1}$	$\frac{13}{3}$
6584	28944 26336	4	$\frac{4 \times 13 + 9}{4 \times 3 + 2}$	$\frac{61}{14}$
2608	6584 5216	2	$\frac{2 \times 61 + 13}{2 \times 14 + 3}$	$\frac{135}{31}$
1368	2608 1368	1	$\frac{1 \times 135 + 61}{1 \times 31 + 14}$	$\frac{196}{45}$
1240	1368 1240	1	$\frac{1 \times 196 + 135}{1 \times 45 + 31}$	$\frac{331}{76}$
128	1240 1152	9		

Here, again, the fifth quotient gives the same ratio ($\frac{135}{31}$) which we obtained before, and is perhaps as accurate as is necessary for the present, till the period itself is further rectified; if not, $\frac{196}{45}$ may be taken; but the $\frac{331}{76}$ is a prime, and the last quotient, 9, would increase the numbers too much, unless a train were required for an instrument with a compound fraction, which may be easily obtained by pursuing the process a little further.

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Wheels for the tropical Revolution of Ceres and Pallas.—We have already proposed to take an average of the periods of these two planets at 4.603386 tropical years, according to which assumption we may proceed, as in the annexed table, to find one ratio of a practical size for the motions of both.

Process for the tropical Revolution of Ceres and Pallas.

Divisors.	Dividends.	Quotients.	Formulae.	Ratios.
				$\frac{0}{1}$
				$\frac{1}{0}$
				$\frac{1}{0}$
1.00000	4.60339 400000	4	$\frac{4 \times 1 + 0}{4 \times 0 + 1}$	$\frac{4}{1}$
60339	100000 60339	1	$\frac{1 \times 4 + 1}{1 \times 1 + 0}$	$\frac{5}{1}$
39661	60339 39661	1	$\frac{1 \times 5 + 4}{1 \times 1 + 2}$	$\frac{9}{2}$
20678	39661 20678	1	$\frac{1 \times 9 + 5}{1 \times 2 + 1}$	$\frac{14}{3}$
18983	20678 18983	1	$\frac{1 \times 14 + 9}{1 \times 3 + 2}$	$\frac{23}{5}$
1695	18983 1695 1933 1695	11	$\frac{11 \times 23 + 14}{11 \times 5 + 3}$	$\frac{267}{58}$
238	1695 1666	7	$\frac{7 \times 267 + 23}{7 \times 58 + 5}$	$\frac{1892}{643}$

In this series of ratios 643, the denominator of the most accurate fraction is a prime number, but the preceding fraction is reducible into $\frac{3 \times 87}{58} = \frac{60}{20} \times \frac{87}{58}$, or more conveniently for practice $\frac{87}{20} \times \frac{60}{58}$, the value of which is 1681^d 8^h 58^m 41^s, the assumed mean being 1681^d 8^h 20^m 30^s. The ratio $\frac{23}{5}$ is the same as was before determined from the sliding rule, without further approximation.

Wheels for the tropical Revolution of Jupiter.—The ratio of Jupiter's velocity in the ecliptic to that of the earth is 11.85682 : 1.00000, therefore we must proceed thus:

Process for Jupiter's tropical Revolution.

Divisors.	Dividends.	Quotients.	Formulae.	Ratios.
				$\frac{0}{1}$
				$\frac{1}{0}$
				$\frac{1}{0}$
1.00000	11.85682 1100000	11	$\frac{11 \times 1 + 0}{11 \times 0 + 1}$	$\frac{11}{1}$
85682	100000 85682	1	$\frac{1 \times 11 + 1}{1 \times 1 + 0}$	$\frac{12}{1}$
14318	85682 71590	5	$\frac{5 \times 12 + 11}{5 \times 1 + 1}$	$\frac{71}{6}$
14092	14318 14092	1	$\frac{1 \times 71 + 12}{1 \times 6 + 1}$	$\frac{83}{7}$
226	14092 1356	62	$\frac{62 \times 83 + 71}{62 \times 7 + 6}$	$\frac{5217}{440}$
80	226 160	2	$\frac{2 \times 5217 + 83}{2 \times 440 + 7}$	$\frac{10517}{887}$
66	80 66	1	$\frac{1 \times 10517 + 5217}{1 \times 887 + 440}$	$\frac{10734}{1327}$
14	66 56	4		

The denominators in the two last ratios of this series are both prime numbers, and if we were to use the eighth quotient, the numbers would run too high for two factors of a moderate size; also if 2 be substituted for unity in the seventh quotient, the denominator will be still a prime number; we must, therefore, necessarily substitute unity for 2 in the sixth quotient, by which substitution we shall have the

ratio or fraction $\frac{5300}{447} = \frac{159}{9} \times \frac{100}{149}$ when put into a practical form, the period corresponding to which is 4330^d 14^h 41^m 17^s.8, which is somewhat more accurate than the one we determined by our indirect method of approximation, but not so convenient for practical construction. The numbers $\frac{83}{7}$, obtained from the fourth quotient, are those used in the common planetarium of the shops.

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Wheels for the tropical Revolution of Saturn.—Saturn performs his revolution through the ecliptic, as we have seen, in 29.42377 tropical years, therefore we may proceed by the following process.

Divisors.	Dividends.	Quotients.	Formulae.	Ratios.
				$\frac{0}{1}$
				$\frac{1}{0}$
1.00000	29.42377 2900000	29	$\frac{29 \times 1 + 0}{29 \times 0 + 1}$	$\frac{29}{1}$
42377	100000 84754	2	$\frac{2 \times 29 + 1}{2 \times 1 + 0}$	$\frac{59}{2}$
15246	42377 30492	2	$\frac{2 \times 59 + 29}{2 \times 2 + 1}$	$\frac{147}{5}$
11885	15246 11885	1	$\frac{1 \times 147 + 59}{1 \times 5 + 2}$	$\frac{206}{7}$
3361	11885 10083	3	$\frac{3 \times 206 + 147}{3 \times 7 + 5}$	$\frac{765}{26}$
1802	3361 1802	1	$\frac{1 \times 765 + 206}{1 \times 26 + 7}$	$\frac{971}{33}$
1559	1802 1559	1	$\frac{1 \times 971 + 765}{9 \times 33 + 26}$	$\frac{1736}{59}$
243	1559 1458	6	$\frac{6 \times 1736 + 971}{6 \times 59 + 33}$	$\frac{11387}{387}$

The numerator in the last ratio of the series is not capable of affording practical factors, and the preceding ratio, $\frac{1736}{59}$, is the same as the one already determined both by the sliding rule, and by our indirect method of approximation.

We come, lastly, to the tropical revolution of the Georgian planet, which we have seen revolves through the ecliptic in 30589.35208 days, and its numbers may be ascertained by the following process.

Divisors.	Dividends.	Quotients.	Formulae.	Ratios.
				$\frac{0}{1}$
				$\frac{1}{0}$
				$\frac{1}{0}$
				$\frac{0}{83}$
365.24222	30589.35208 2921937777	83	$\frac{83 \times 1 + 0}{83 \times 0 + 1}$	$\frac{83}{1}$
	136997431 109572666			
27424764	36524222 27424764	1	$\frac{1 \times 83 + 1}{1 \times 1 + 0}$	$\frac{84}{1}$
9099457	27424764 27298373	3	$\frac{3 \times 84 + 83}{3 \times 1 + 1}$	$\frac{335}{4}$
126391	9099457 884737	71	$\frac{71 \times 335 + 84}{71 \times 4 + 1}$	$\frac{23869}{285}$
	252087 126391			
125696	126391 125696	1	$\frac{1 \times 23869 + 335}{1 \times 285 + 4}$	$\frac{24204}{289}$
694	125696	181		

The value of the last ratio of this series is equal to 83.7508650 tropical years, which differs from the exact truth only unity in the seventh place of decimals, but unfortunately it is not reducible into lower numbers than $\frac{2017 \times 12}{17 \times 17}$; and the numerator of the next preceding ratio

is a prime number, so that we must either use $\frac{335}{4}$, which has been before determined, or otherwise substitute another quotient for 71; the most convenient, we find from a few trials, will be 66, which gives the ratio $\frac{22194}{265}$, the value of which is a revolution in 83.750943 tropical years, or 30589^d 9^h 8^m 10^s.7, and is capable of forming the train $\frac{162}{5} \times \frac{137}{53}$.

These examples of all the primary planets given at full length, and accompanied by our remarks on them, will enable any well educated instrument maker to ascertain wheelwork from any other data which he may have occasion to employ, and will serve, at the same time, to shew that the two methods of approximating towards the truth, where the original numbers run too high for construction in practice, supply the defects of each other in particular cases, but generally come by different routes to the same mark.

By either of these methods, the periods of all the secondary planets may be represented by ratios suitable for
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composing

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composing wheelwork, and any particular time may be assumed, that the machine most conveniently admits of, for the period in which the first driver revolves. For instance, the motion of the moon's apogee, or nodes, may be taken from the lunation; and the lunation from either a solar day, or a solar year. Likewise the satellites of Jupiter may have their motions given from one day, or seven days, or any other period consisting of days and fractional parts of a day, when reduced into one denomination; all which calculations will fall under our examination, when we come to treat of the machines, where they occur, under our articles ORRERY, and PLANETARIUM, but an account of which would lengthen our present article too much, were it given in this place.

Numbers for synodic Revolutions.—We must not, however, conclude our present article on planetary numbers, before we have made some remarks on the synodic revolutions of the primary planets, particularly as we shall have occasion to describe in another place, a very superior machine constructed entirely from calculations founded on the synodic periods. If it were required to ascertain the mean synodic period, or time elapsed between two successive conjunctions or oppositions of any two planets, as seen from the sun, or of the sun and one of them as seen from the other, which is indeed the same thing, we must take the difference of the mean daily motions of those planets as given in the tables, and divide 360° thereby, and the quotient will give the required number of days between two such mean conjunctions; for instance, suppose it were required to determine the number of days between two successive oppositions or

conjunctions of Venus with the sun, as seen from the Earth, or with the Earth, as seen from the Sun; the mean daily motion at Venus is $1^\circ 36' 7''.8$, and of the Sun (or rather Earth) $0^\circ 59' 8''.33$, the difference between which is $0^\circ 36' 59''.47$, or $2219''.47$, by which if we divide $1296000''$ we shall have 583,923 days for the mean time between two successive conjunctions or oppositions, as the case may be, which mean time would also be the *true* time, if the Earth and Venus had no equation of the centre, and consequent acceleration and retardation in the different parts of their orbits; if we take Mercury instead of Venus, the synodic

period at a mean rate would be $\frac{1296000}{11184.24} = 115,877$ days;

but as Mercury's orbit has considerable excentricity, the synodic period in any given year may exceed or fall short of this number by many days, accordingly as the sun's place may be near the aphelion or perihelion of the planet's orbit, when the conjunction or opposition takes place. Again, if we take Mercury and Venus, the synodic period will be

$\frac{1296000}{8964.77} = 144,566$ days, but subject to an excess or de-

fect arising from the relative situations in their respective orbits. In the same manner we may use the difference of any two other mean daily motions, to ascertain their synodic period, agreeably to the results contained in the subjoined table, which we beg leave to insert here on account of its novelty as well as utility.

A TABLE of the relative mean synodic Revolutions of all the primary Planets, expressed in Days and Parts of a Day.

Planets.	Georgian.	Saturn.	Jupiter.	Pallas and Ceres.	Juno.	Vesta.	Mars.	Earth.	Venus.
Mercury	88.290	88.694	89.792	92.825	93.178	94.174	100.888	115.877	144.566
Venus	226.358	229.493	236.993	259.355	261.654	270.169	333.917	583.923	
Earth	370.713	378.091	398.892	466.606	474.101	502.813	779.938		
Mars	702.713	733.836	816.434	1161.394	1208.955	1415.002			
Vesta	1395.950	1524.347	1930.007	6480.000	8302.370				
Juno	1678.104	1867.166	2514.552	2952.164					
Ceres and Pallas	1779.242	1993.233	2748.674						
Jupiter	5044.960	7253.595							
Saturn	16568.625								

N.B. In this table the synodic periods of Vesta, Juno, Ceres, and Pallas, must not be considered as perfectly accurate; their tropical periods being not yet completely ascertained.

As an example of the use of this table, suppose the synodic revolution of Mars were required, as seen from Jupiter; look for Mars on the left hand column, and Jupiter at the top of the table, and at the junction of the horizontal and vertical columns, in which those planets stand respectively, is the number 816.434, the number of days required. In like manner, the number of days for Venus and the Earth is 583.923.

In the course of our making calculations for the motions of the heavenly bodies, where some of the wheelwork was placed on stationary, and some on moveable bars, a discovery was made, relating to synodic revolutions, which will appear extraordinary, even to the scientific reader; which is this, that if the wheelwork which has been calculated to represent or produce the synodic revolutions of either of the interior planets, be placed upon the Earth's annual bar, (or radius

vector,) *those same calculations* will be proper for exhibiting the tropical revolution of that planet, as seen from the sun. This circumstance we have already glanced at, when calculating the tropical period of Venus by our indirect method of approximation, but we will now illustrate the observations we have made by an example. In a small orrery, at present before us, the ratio between the tropical revolution of Venus

and a solar year is calculated to be $\frac{2016}{3277}$, but because the

wheelwork composed of this ratio is carried by the Earth's annual arm, at least such parts of it as revolve out of the centre of the instrument, Venus is carried *once* round, independently of the calculations, in every year, by a push given to the last wheel in the train, moving in the centre round the sun's stem, as the Earth's arm goes round it, while the teeth of all the wheels are connected; *unity* is, therefore, ejected out of the ratio before the train is composed, thus; the numerator 2016 is subtracted from the denominator 3277, and the remainder, 1261, is taken as the denominator of the reduced

reduced ratio, out of which the train is composed; now we say that $\frac{2016}{3277}$ of 365.24222 days is equal to the tropical

period $224^d 16^h 42^m 1^s$, but that $\frac{2016}{1261}$ of the same stand-

ard, is equal to the synodic revolution 583.924 days, very nearly as in our table. Hence when we have procured the exact ratio between the tropical periods of the Earth and an interior planet, we can immediately procure the length of a mean synodic revolution of the latter, without regard being had to the daily motions, as is usually done by astronomical writers.

The same observation is equally true with respect to any other two of the planets in the system, whose tropical ratio is known, provided the diminished part be made the denominator of the fraction constituted by the said ratio. To a want of attention to this sort of reduction of a tropical into a synodic period, and *vice versa*, is owing the very great inaccuracy of some instruments of illustration at present to be met with in the shops; particularly of that common orrery, known by the name of Ryley's, in which the *synodic* revolutions of both Mercury and Venus are produced in periods which were intended, by the contriver, to be either *sidereal* or *tropical*, and which are actually considered to be so by the instrument makers. Thus those periods which *ought* to be 115.877 and 583.923 days respectively, are only about $86\frac{1}{2}$ and $219\frac{1}{2}$; in the latter of which instances the velocity of the planet, in its orbit, is considerably more than *double* its true velocity, and yet the error has never, that we know of, been detected by any one; a convincing proof this of the inattention, not only of those who constructed, but also of those who have used this little machine, to explain the nature of the planetary motions!

NUMBERING RODS. See NEPER'S Bones.

NUMBERS, in *Biblical History*, a canonical book of the Old Testament, one of the five books called the Pentateuch, and ascribed justly, as we conceive, to Moses the Jewish lawgiver. It is so called because it begins with the numbering of the children of Israel that came out of Egypt; to which are subjoined the laws given to them for the space of 39 years, whilst they were in the wilderness. See PENTATEUCH.

NUMELLA, among the Romans, an engine of wood used in punishing offenders, whose necks and feet were made fast in it.

NUMELLA was likewise used to denote a rope or cord made of raw ox-hides to bind beasts with.

NUMENIA, *Νεμνία*, or *νεμνία*, in *Antiquity*, a festival observed at the beginning of every lunar month, in honour of all the gods, but especially Apollo, who was called *Νεομηνιος*, because the sun is the author of all lights; for whatever distinction of times and seasons may be taken from other planets, yet they are all owing to him, as the original and fountain of all those borrowed rays, which the rest have only by participation from him.

For the ceremonies of this solemnity, see Potter, Arch. tom. i. p. 416.

NUMENIASTÆ, *Νεμνιασταί*, a designation given to those who kept a festival on every new moon. See NUMENIA.

NUMENIUS, in *Biography*, a Greek philosopher of the Platonic school, who is supposed to have flourished under the reign of the emperor Marcus Aurelius, was born at Apamea in Syria. He was regarded as an oracle for wisdom, and is

mentioned with respect both by Plotinus and Origen. Of the works which he wrote none are now extant, excepting some fragments preserved by Eusebius, Theodoret, and Clemens Alexandrinus. He is said to have maintained that Plato borrowed from Moses what he advanced concerning God and the creation of the world. Moreri. Euclid's Hist. Phil.

NUMENIUS, in *Ornithology*, a name used by authors for the different species of the *Scolopax* and *Tantalus*; which see.

NUMERAL FIGURES. The antiquity of these in England has been supposed as high as the eleventh century, from an ancient date found at Colchester, at first thought to express 1090; the figure in the place of hundreds being taken for a cypher, by not attending to the inside strokes, which were pretty nearly defaced; but upon a more accurate view that mistake was discovered, and the date found to be 1490. See Phil. Trans. N° 439 and 475. See ARABIC Figures, and FIGURES.

NUMERAL Letters, those letters of the alphabet which are generally used for figures; as, I, V, X, L, C, D, M.

NUMERAL Characters. See CHARACTERS.

NUMERALS, in *Grammar*, are those words which express numbers; as six, eight, ten, &c. See ORDINALS.

NUMERATION, in *Arithmetic*, the art of estimating or pronouncing any number, or series of numbers.

The characters, whereby numbers are ordinarily expressed, are the nine following ones; 1, 2, 3, 4, 5, 6, 7, 8, 9. It being the law of the common numeration, that when you are arrived at ten, you begin again, and repeat as before; only expressing the number of tens.

Weigelius, indeed, shews how to number, without going beyond a quaternary; *i. e.* by beginning to repeat at each fourth. And Leibnitz, in what he calls his "binary arithmetic," begins to repeat at every second; only using two characters, 1 and 0. But these are rather matters of curiosity than use.

That the nine numerical notes may express not only units but also tens or decads, hundreds or centuries, thousands, &c. they have a local value given them; so as that, when either alone, or when placed in the right-hand place, they denote units; in the second place, tens; in the third, hundreds; and in the fourth, thousands.

Now to express any written number, or assign the proper value to each character: divide the proposed number by commas into classes, allowing three characters in each class, beginning at the right hand. Over the right-hand figure of the third class, add a small mark, or transverse line; over the right-hand figure of the fifth class, add two marks, or transverse lines; over that of the seventh, three, &c. The number of the left hand of the first comma, expresses by thousands; that which has over it the first transverse line, expresses by millions; that with two, by billions; that with three, by trillions, &c. Lastly, the left-hand character of each class, expresses by hundreds; the middle one by tens; and the right-hand one by units. Thus will the numeration be effected.

E. gr. The following numbers $2''$, $125,473''$, $613,578'$, $432,597$, is thus expressed or read: two trillions, one hundred twenty-five thousand four hundred seventy-three billions, six hundred thirteen thousand five hundred seventy-eight millions, four hundred thirty-two thousand five hundred and ninety-seven.

NUMERATOR, in speaking of fractions, signifies the number which shews how many of those parts, which the

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integer

integer is supposed to be divided into, are expressed by the fraction.

The numerator is that part of a fraction which is placed over the little bar, by which it is separated from the under number called the denominator, and which shews into how many parts the integer is divided.

Thus, *v. gr.* $\frac{7}{10}$ expresses seven tenths; where seven is the numerator and ten the denominator. See FRACTION.

NUMERIANUS, M. AURELIUS, in *Biography*, an emperor of Rome, in conjunction with CARINUS, (see his article,) was second son of the emperor CARUS. On the death of his father in the year 283 of the Christian era, Numerianus, with Carinus his elder brother, succeeded to the imperial dignity without opposition. They had been nominated Augusti by their father, whom Numerianus had accompanied in his expedition into Persia. This young prince was distinguished by the promising qualities of his temper and understanding. He was mild and affable, and had from a very early period cultivated literature with success. Being, in his youth, in a private station, he had exercised his talents for oratory in pleading causes, and several of his harangues had been given to the public, in which the declamatory eloquence of the age appeared with lustre. Gibbon, in speaking of the brothers, says, "Carinus was unworthy to live: Numerian deserved to reign in a happier period. His affable manners and gentle virtues secured him, as soon as they became known, the regard and affection of the public. He possessed the elegant accomplishments of a poet and orator, which dignify, as well as adorn, the humblest and the most exalted stations. But the talents of Numerian were rather of the contemplative, than of the active kind." When his father's elevation reluctantly forced him from the shade of retirement, neither his temper nor his pursuits had qualified him for the command of armies. His constitution was destroyed by the hardships of the Persian war; and he had contracted, from the heat of the climate, such a weakness in his eyes, as obliged him, in the course of a long retreat, to confine himself to the solitude or darkness of a tent or litter. The administration of all affairs, civil as well as military, was devolved on Arrius Aper, the Prætorian prefect, who, to the power of his important office, added the honour of being father-in-law to Numerian. The army was eight months on its march from the banks of the Tigris to the Thracian Bosphorus, and during all that time the imperial authority was exercised in the name of the emperor, who never appeared to his soldiers. Suspensions at length spread among them that their emperor was no longer living, and they could not be prevented from breaking into the imperial tent, where they discovered only the corpse. How or what time he died was never ascertained, but the general voice accused Aper of being his murderer: his concealment was interpreted as an evidence of guilt, and the measures which Aper had taken to secure his election, became the immediate occasion of his ruin: Diocletian, commander of the body-guards, was chosen in the room of Numerianus, and conscious that his peculiar situation might expose him to suspicion, he ascended the tribunal, and raising his eyes to the sun, made a solemn profession of his own innocence, in the presence of that all-seeing Deity: then, assuming the tone of a sovereign and judge, he commanded that Aper should be brought in chains to the foot of the tribunal. "This man," said he, "is the murderer of Numerian," and without giving him time to enter on a justification of his conduct, drew his sword, and buried it in the breast of the unfortunate prefect. (See DIOCLETIAN.) Gibbon's Roman History, vol. ii.

NUMERICAL, NUMEROUS, or *Numeral*, something that relates to number.

NUMERICAL *Algebra* is that, which makes use of numbers, instead of letters of the alphabet.

NUMERICAL *Difference*, is the difference whereby one individual is distinguished from another.

Hence a thing is said to be numerically the same, *idem numero*, or *numerie*, when it is the same in the strictest sense of the word. See UNITY and IDENTITY.

NUMERO, in *Commerce*, &c. a term prefixed to any number of things; marked or abbreviated thus, N°. See BOOK.

De NUMERO, *i. e.* by tale, is used in ancient authors for the payment *e. gr.* of a pound in a certain number of pieces, *viz.* twenty shillings.

In contradistinction to *libra pēsa*, or a pound weighed out.

NUMEROUS ARITHMETIC. See ARITHMETIC.

NUMEROUS *Exegesis*. See EXEGESIS.

NUMIDIA, in *Ancient Geography*, a country of Africa, comprehended, according to Strabo, the kingdoms of the Massyli and Massæyli, the last of which was bounded on the W. by the river Mulucha or Molochath, as the first was on the E. by the Tusca. On the N. it was limited by the Mediterranean; on the S. by Gætulia, or part of Libya interior; on the W. by the Mulucha, which separated it from Mauritania, and on the E. by the Tusca, a boundary which it had in common with Africa Propria. Its length was probably, allowing Mulucha to be the present Mulloofah of the Algerines, and Tusca to be Zaine, above 500 miles; but its breadth cannot be so easily ascertained. However, if we suppose it to be nearly the same with the present kingdom of Algiers, which we have reason to believe was actually the case, it must in the narrowest part have been about 40 miles; that being the distance near Tlemsan from the desert or Sahara to the sea-coast, and above 100 in the broadest. In the times of the Carthaginians, Numidia contained the two powerful nations of the Massyli and the Massæyli. Numidia, including Numidia Propria, or the country of the Massyli, and Mauritania Cæsariensis, or that of the Massæyli, extended from 34° 5' to 37° N. lat., and from 1° 15' W. to 9° 16' E. of London.

Numidia Propria, or as it is sometimes called, Terra Metagonitis, was separated from the proper territory of Carthage by its eastern boundary, the river Tusca, and from the kingdom of the Massæyli, or Mauritania Cæsariensis, according to Pliny, by the Ampsaga. This seems to correspond with that part of the province of Constantina lying between the Zaine and the Wed el Kibeer, which is above 130 miles long and more than 100 broad. On the sea-coast this province is, in general, mountainous and rocky, and therefore called by Abulfeda, not improperly, "El Adwah," the high or lofty. The principal places in this province were Cirta, Vaga, Azama, Collops Magnus, Tacatwa, Hippo Regius, Tabraca, Naragara, Sicca, Thir-mida, Suthul, and Madaura. The mountains were the ridge that terminated the country between the parallels of Sitifi and Cirta, called by the ancients Buzara, Thambes, extending to Tabraca, the Mampsarus of Ptolemy, which separated the Sahara from Mauritania Stifensis, and the Mons Audus of Ptolemy, or the Mons Aurasius of the middle ages, known among the Turks by the name of Jibbel Aurels. The rivers are the Ampsaga, the Armua of Pliny or modern Sei-boufe, the Rubricatus of Ptolemy or Ma-fragg of the Algerines, and the Tusca now called the Zaine.

The limits and extent of the Regio Maffæylorum of Strabo, or the Mauritania Cæſarienſis of Dio, being the tract lying between the Mulucha and Ampſaga, are aſcertained by the determination of thoſe of Numidia in general, and Numidia Propria, or the country of the Maffæyli, in particular. The length of the former province, indeed, much exceeded that of the latter; but its breadth was not conſiderable, being at a medium only about 20 leagues, except in that part which bordered upon the confines of the Maſſyli. It lay betwixt $34^{\circ} 30'$ and 37° N. lat., and extended from $1^{\circ} 15'$ W. to $6^{\circ} 30'$ E. long. from London. It included that part of the country of the Weſtern Moors, bounded on the W. by the Mullooiah, and on the E. by the mountains of Trara; thoſe provinces of the kingdom of Algiers, called Tlemſan and Titterie; together with the weſtern part of that known by the name of Conſtantia. The principal towns were Igilgili, Saldæ, Ruſazuſ, Ruſucurium, Ruſconium, Icoſium, Tipaſa, Jol, Canucius or Ganugus, Cartenna, Arſenaria, Quiza, Siga, Sitifi and Satafi, Auzia or Anzea, Tubuſuptuſ, &c. &c. The promontories were the Audus and Vabar of Ptolemy, the promontorium Apolliniſ, or cape Tennes of modern geographers, the promontorium Magnum of Ptolemy, now called by ſailors Cape Hone, being a continuation of the mountains of Trara. The remarkable mountains are part of mount Atlas, the Zalacus of Ptolemy, mount Malathubalus, the Durdus of Ptolemy, the Mons Phruſuſ, and the Montes Chalcorychii. The moſt remarkable rivers were the Audus, the Siſaris, the Niſſava, or preſent Boujeiah, the Sarbatiſ, now the Yſſer, the Savuſ or modern Hameeſe, the Chinalaph of Ptolemy or Shelliff of the Algerines, the Cartennes, the Flumen Salfum, at preſent called the Wed el Mailah, and Aſſara or Iſſer of Abulſſeda. The only iſlands that deſerve attention are the Acra of Scylax, forming the modern part of Harſhgoone, and the Tres Inſulæ of Antoninus, about 10 miles N.W. of the river Mulucha.

The aborigines of Numidia were the deſcendants of Put or Phut; but theſe were not the only ancient inhabitants, becauſe the Phœnicians in almoſt the earlieſt ages ſent colonies thither. Although a conſiderable part, if not the whole, of Interior Numidia was independent on the Carthaginians, the Numidians always aſſiſted the Carthaginians in their wars; and the Carthaginian form of government prevailed in every part of Numidia ſubject to the ſtate of Carthage, though in other parts abſolute monarchy was eſtabliſhed. The principal objects of worſhip among the firſt Numidians were the ſun and moon; and where the dominion of Carthage extended, divine honours were paid to the Phœnician and Greek deities. Notwithſtanding the barbarity of the Numidians, ſome of them uſed letters, not very unlike thoſe that made up the Punic alphabet, as appears from the legends of ſeveral ancient Numidian coins. The Numidians were divided into tribes, nomes, or hordes; and their circular dou-wars were compoſed of their mapalia, correſponding to the hymas or tents of the modern Bedoweens. Theſe mapalia were ſecured from the heat and inclemency of the weather by a covering of hair-cloth. They were all of the ſame oblong form, reſembling the inverted bottom of a ſhip. A whole tribe encamped together, and having conſumed the produce of one fruitful ſpot, migrated to another. Some of them lived in fixed habitations or cottages, made of hurdles daubed over with mud, or conſtructed of ſlight materials, and theſe they called magaria. The towns or villages formed of theſe huts are at preſent built upon eminences, and, as Dr. Shaw informs us, they are called daſhkraſ. The Numidians rode without ſaddles,

and many of them without bridles, whence Virgil calls them "Numidæ Infræni;" and as their principal ſtrength conſiſted in their cavalry, they were accuſtomed to the management of horſes from their infancy. The next brother of the king, and not his eldeſt ſon, ſucceeded to the crown in Numidia. The diet of the Numidians conſiſted chiefly of herbs, grain, pulſe, and water; and they ſeldom uſed wine or fleſh. Many of the poorer claſs went almoſt naked; but thoſe of any faſhion wore their garments looſe, without ſaſh or girdle. They were eminent for their ſkill in hurling the javelin and throwing darts, which they uſed in war: and they choſe to come to a general action in the night. Amongſt them deſertion was no diſgrace.

Before the firſt arrival of the Phœnicians, Numidia was thinly peopled; and this happened above 300 years before the foundation of Carthage. Little is now known of theſe people for ſeveral of the earlieſt centuries; and it would lead us beyond our preſcribed limits, if we gave a minute detail of their conſlicts with the Carthaginians and with the Romans. Towards the cloſe of the exiſtence of Numidia as an independent kingdom, Juba, the ſon of a Numidian prince, deſcended from Maſſiniſſa, was inſulted by Cæſar; and in conſequence of this, the African prince adhered cloſely to the Pompeian faction, gained ſome advantage over one of Cæſar's lieutenants, and reduced Cæſar himſelf to great extremities. At length Cæſar overthrew Scipio, Juba, and Labienus, and by a deciſive action made himſelf maſter of Numidia, which he reduced to a Roman province. See MAURITANIA.

NUMIDIA, Pintado, in *Ornithology*, a genus of birds of the order Gallinæ. The generic character is this; the bill is ſtrong and ſhort, the baſe of it covered with a carunculate cere receiving the noſtrils; the head is horned, with a compressed coloured callus; tail ſhort, bending down; the body is ſpeckled. There are four ſpecies comprehended in this genus, of which the moſt intereſting is the Meleagris; we ſhall, however, deſcribe them all.

Species.

MELEAGRIS; the Guinea Hen. There are three varieties of this ſpecies. In the *firſt*, the caruncles at the gape are double; in the *ſecond*, the breſt is white; and in the *third*, the body is entirely white. It is an inhabitant of Africa, and is domeſticated in moſt parts of Europe; is about 22 inches long, and makes a harſh unpleaſant cry. The bill is of reddiſh horn colour; the head is blue; the crown conic, compressed, with a blueiſh-red protuberance; the upper part of the neck is of a blueiſh-aſh, almoſt naked; the lower part is feathered, verging to violet; the body is black, with round white ſpots; the legs are grey-brown; and the gular caruncle of the male blueiſh, female red. The meleagris is noiſy, reſtleſs, and turbulent, continually moving from place to place, and domineering over the whole poultry-yard. The turkey, though twice its ſize, is in continual apprehenſion from its petulance. The birds of this genus ſeem in many reſpects to reſemble the common poultry. Like them, they ſcratch the ground, and go in large flocks, feeding their young and pointing out their food. In the Cape de Verde iſlands ſeveral hundreds are ſometimes ſeen together; here the inhabitants hunt them with dogs; and, as their flight is heavy, whenever they are run down they are eaſily killed or caught. The male and female ſo nearly reſemble each other, that they can hardly be diſtinguiſhed; the only difference is, that the wattles, which are blue in the former, are inclining to red in the latter. Pintados, as has been obſerved, were originally from Africa, and were known under the name of Numidian hen's.

hens. They are more commonly domesticated in those countries that border on the Mediterranean than with us. In our climate, which is evidently too cold for them, they are neither fertile, nor easily reared, and are kept rather for show than use. In countries adapted to their nature, the female lays a great number of eggs, which she endeavours to secrete, till she has produced her young brood. The eggs are smaller than those of a common hen, and of a rounder shape. They are reckoned very fine food. During the night, the Guinea-fowl perches on high places, and if disturbed, alarms the neighbourhood by its unceasing cry. In its natural state of freedom it prefers marshy places. It is easily tamed, but often abandons its young. An hybrid race has been produced between these birds and our common poultry, but, as is usual, it seems incapable of reproduction.

MITRATA; the Mitred Pintado. Caruncles at the gape double; the gular fold is longitudinal. It inhabits Madagascar and Guinea; and is the size of the last.

CRISTATA; the Crested Pintado. This has no caruncle; on each side the gape is a longitudinal fold. This is a native of Africa.

ÆGYPTIACA; the Egyptian Pintado. This is black, spotted with blueish; the crown is crested; head and neck rufous.

NUMISMATOGRAPHIA, a Greek term used for the description of ancient medals and coins, whether of gold, silver, or brass.

Fulvius Ursinus, Ant. Augustinus, bishop of Saragossa, Erizzo, a noble Venetian, and Sambucus, a Polish gentleman, have all succeeded in the numismatographia. Nor must the more modern authors on the same subject be omitted, viz. the two Mezzabarbs, Patin, Spanheim, Hardouin, Morel, Vaillant, Joubert, Baudelot, Beger, and, among ourselves, Evelyn.

NUMISMATOLOGY, **NUMISMATICS**, terms used for the science which treats on COINS and MEDALS, to which articles the reader is referred. We add, however, in this place, a short account of a few of the most celebrated public collections, not touched upon in the above articles.

The *Hunterian collection*, which is now in the possession of the university of Glasgow, to which it was bequeathed by Dr. Hunter's will, is one of the most celebrated in Europe. The foundation of this collection was laid in the year 1770, from those of the Rev. Mr. Dawes and Thomas Sadler, esq. The next year added much to the stock from various cabinets, particularly that of Isaac Jamineau, his majesty's consul at Naples. Mr. Sainthill, surgeon, in 1772, the prince of Peralta, and Mr. West in 1773, continued to enrich Dr. Hunter's cabinet. In 1776, the Egyptian coins were much increased from the collections of Mr. J. Bruce, and Mr. C. Lindegreene, a Swede, who had resided in Egypt. Mr. Dorana added his collection to Dr. Hunter's in the same year, and it contained the accumulated treasures of many elegant scholars and eminent antiquaries. At the same time, Mr. White supplied, from his museum, those coins which were wanting in Dr. Hunter's; and, as if this year was to be distinguished by the value of the acquisitions, and the characters of the benefactors, Dr. Russell supplied those deficiencies which his ample collection enabled him to discover. The year 1777 furnished still additional stores from Dr. Combe, a foreign nobleman, Mr. Swinton, Mr. J. Smith, the Rev. Dr. Eyre, and Mr. Samuel of Lincoln, and from numerous other benefactors. In the year 1782, Dr. Combe published his "*Nummorum veterum Populorum et Urbium qui in Museo Gulielmi Hunter asservantur Descriptio*;" a highly useful work, in which the Greek and

Roman coins of the collection are arranged according to the different cities in which they were struck.

Of the very rich collection of coins and medals in the *British Museum*, we are as yet without a descriptive work; part of which will, however, soon be presented to the public. The following short account is from the "*Synopsis*" of the contents of that celebrated repository. This collection, the basis of which was formed by the cabinets of sir Hans Sloane and sir Robert Cotton, has been from time to time enlarged by many valuable purchases and donations, but principally by the munificent bequest of the Rev. C. M. Cracherode. It is comprehended under the three following heads. 1. Ancient coins. 2. Modern coins. 3. Medals. The first of these heads consists of Greek and Roman coins. The Greek coins are arranged in geographical order, and include all those which are struck with Greek characters, in Greece, or elsewhere, by kings, states, or cities, which were independent of the Romans. With this class are placed, likewise, the coins of free states and cities, which made use of either the Etruscan, Roman, Punic, Spanish, or other characters. The Roman coins are placed, as far as it can be ascertained, in chronological order. They consist of the *As* in its divisions; family or consular coins; imperial coins struck in Rome; imperial coins struck in Egypt; imperial coins struck in the Roman colonies; imperial coins struck with Punic characters; contorniates.

The second head, comprising modern coins, consists of Anglo-Saxon, English, Anglo-Gallic, Scotch, and Irish coins, and likewise the coins of foreign nations. This class is arranged according to the respective countries to which the coins belong, those of each country being kept separate.

The third head, which comprises a class considerably more modern than either of those which precede it, consists of medals struck in our own country, and of those which have been struck abroad. These are arranged in the same manner as the modern coins.

The collection of the late king of France, now called the Imperial collection, preserved in the National library of Paris, is by far the greatest in Europe. The considerable treasures formerly collected by Boze, the Marechal d'Etreés, Séguin, Patin, and in more modern times by Pellerin, are now all incorporated with that most valuable collection. Its basis was formed by Louis I. at Fontainebleau: Henry II., Louis XIII., and particularly Louis XIV., have increased its treasures with royal munificence; and the last of the just mentioned monarchs caused the large medals of this cabinet to be engraved by de la Boffière. Besides the above mentioned private collections, this cabinet acquired, in 1793, the *Cabinet de Ste. Geneviève*, at Paris; some years after it was increased by the antique coins of the Stadtholder, and in 1798, by the collection of the Vatican, the collection which formerly belonged to queen Christina of Sweden, the medallions from the collections of cardinals Carpegna and Albani, &c. (See *Histoire abrégée du Cabinet des Medailles et antiques de la Bibliothèque nationale*, par A. L. Cointreau, 1800.) An idea of the value of the present collection may be formed by the valuation made of it above forty years ago, which amounted to no less than six millions of livres. The *Cabinet de Ste. Geneviève*, which, having been threatened by robbers in 1793, was removed to the National library, and incorporated with the great collection, has been described by Claude du Molinet in 1692.

The celebrated imperial collection of coins at Vienna, if we except that of Paris, stands unrivalled among the cabinets of the continent. It was begun by the emperor Ferdinand I., and soon considerably increased by the accession of other collections, such as that formed by the archduke Albert, under

under the direction of the Chifflets; and the most valuable collection formed by the archduke Ferdinand at Ombra in Tyrol. It was afterwards considerably added to by the collections of the learned monarchs Maximilian I. and Rudolph II.; but particularly by the zeal of the emperor Charles VI., who was himself a great lover of numismatology, and who purchased the cabinets of the Carthusians at Rome, together with that of count Parr. In the reign of Maria Theresa it was farther increased by the purchase of the Granelli collection. Several years ago, the number of coins and medals of this collection amounted to upwards of 40,000, of which about 22,000 were antique. We possess a masterly catalogue of the Vienna collection by the celebrated Joseph Eckhel, published as early as 1779, and therefore far from giving a correct idea of the present state of that highly valuable repository.

The Prussian cabinet of medals is considered the greatest in Germany, next to the Imperial collection of Vienna. The celebrated Laurent Beger published a catalogue of this collection, in three volumes folio, entitled "Thesaurus Brandenburgicus selectus, Coloniz Marchicæ, 1696, 1699, and 1701." Though king Frederic William I. took out a number of large gold coins, (among which was the very large one, eight pounds, or five hundred ducats in weight, bearing the portraits of Frederic William the Great, and his queen,) which were converted into small current money, yet the collection is still richly furnished: the number of its antique treasures has not long since been increased by 6000 coins from the cabinet of the late margrave of Anspach; and baron Knobelsdorff, the Prussian ambassador at Constantinople, has transmitted many valuable contributions lately discovered in those classic regions which have been the field of the baron's antiquarian researches.

Next in importance among the numismatical collections of Germany, is that of Gotha, the basis of which was formed by Ernest the Pious. It was materially increased by the excellent Arnstadt cabinet of medals, which was formed by Antony Gunther, prince of Schwarzburg, assisted by several celebrated antiquaries and historians, such as Andreas Morellus, Christian Schlegel, Olearius, &c. This latter collection was purchased, in 1713, by John Frederic, duke of Saxe-Gotha, for the sum of 100,000 dollars. It is preserved in small cabinets, each of which is placed on a table, furnished below with a shelf for books relative to the coins above. This celebrated collection has been at different times considerably increased by others, such as those of Schachman and Sultz, that of Mr. Gerding, rich in scarce Greek coins, that of baron Seckendorf, &c. The coins in the Gotha collection are still arranged after the old way, by the sizes and metals, and the same mode is adopted in the catalogue, seven volumes of which comprize the antique coins as follows: gold coins, kings; coins of cities and free states; coins of families; imperial silver; coins of first size; coins of second and third size. There are printed catalogues of the collections of Schachman and Sultz, which are kept separate. A systematic catalogue of the whole collection would be very desirable. There is an old catalogue of the antique coins of the original collection by Liebe (Gotha numaria, fiftens Thesauri Fridericiani numismata antiqua, 1730, fol.) A history of the rise and progress of this important cabinet has been published by Schlichtegroll in 1799.

NUMITOR, in Biography, the son of Procas, king of Alba, and the brother of Amulius. Procas, before his death, made him and Amulius joint heirs to the crown, on condition of their reigning annually by turns; but Amulius, on getting possession of the throne, excluded Numitor,

whose son, Lausus, he ordered to be put to death, and obliged Rhea Sylvia, Numitor's only daughter, to become a vestal. This princess having become pregnant, declared that she was with child by the god Mars, and afterwards brought forth twins, named Remus and Romulus, who at length killed Amulius, and restored Numitor to the throne. This circumstance occurred in the year 754 B.C.

NUMMES, in Geography, a town of Sweden, in the province of Nyland; 20 miles N. of Helsingborg.

NUMMULARIA, in Botany. See ANAGALLIS and LYSIMACHIA.

NUMMULARIUS, among the Romans, was used to signify a banker, or person who deals in money.

It likewise denoted an assayer, or one who estimated the goodness and value of money, as to its weight and fineness of metal.

NUMMUS, or NUMUS, among the Romans, a particular piece of money, otherwise called *sestertius*, or *sesterce*; which see.

This was sometimes called *nummus sestertius*. *Decem millia nummum*. & *decem millia sestertium*, were Roman sums, which amounted to the same.

NUN, NONNA, the feminine of *Nonnus* or *Domnus*, quasi *Dominus*, a word anciently used for a female religious, and still retained in that sense in our language and in other languages, particularly the French, but by way of ridicule and burlesque. Those of the Benedictine, and certain other orders, have still the abbreviation of *Dom* affixed to their names. The rule of St. Benedict, drawn up in the 6th century, ordains, "Juniore suos priores *Nonnos* vocent, quod intelligitur paternæ reverentia."

The word comes from *nonna*, *nonnana*, or *nonnanis*, all Latin terms, first used for penitents, then for religious. Borel derives it from *nonno*, or *nenna*, which, in Italian, signifies *grandfather* or *grandmother*; and adds, that it was applied by way of honour to the woman, as that of *father* to the man, religious.

Nun, or *nonnes*, used to signify a monk, are of Hebrew extraction, from *nin*, or *nun*, a son.

Hence also *nunnery*, a monastery of female religious.

NUN, in Geography, a river of Africa, which runs into the Atlantic, N. lat. 4° 40'. W. long. 5° 6'.

NUN, or *Vled de Nun*. See VLED DE NUN.

NUN, in Ornithology, the common English name for the *parus caruleus*, or blue titmouse, distinguished from the common titmouse by its smallness, and by its having its blue head surrounded by a white line.

NUN, White. See MERGUS *Albellus*.

NUN is also the name of a peculiar species of pigeon, called by Moore the *columba vesfalii*. It is but a small pigeon, but sometimes larger than the jacobine, and has a very particular plumage, from which it takes its name, its head being as it were covered with a veil.

The body of this species is all white; the head, tail, and six of the flight-feathers black, red, or yellow; the eyes are pear-coloured, and the hood white: this is a large tuft of feathers on the hinder part of the head, and the more numerous they are, the more the bird is esteemed. This is a very beautiful species of pigeon, and is very much esteemed. Some of its feathers, however, will vary sometimes from their true colour; these birds are called fowl-feathered: but it is a mere accidental variety, the young of such being often as perfect and beautiful as of any others.

NUNCAR, in Geography, a town of Hindoostan, in the circar of Mahur; 3 miles S.E. of Mahur.

NUNCIATION, NUNCIATIO, among the Romans, was particularly

particularly used to signify the report which the augur made concerning what he had seen.

This he did to the chief magistrate present, and the magistrate communicated the same to the people, and so dismissed the assembly, which was called *obnunciation*.

NUNCIO, or **NUNTIO**, an ambassador from the pope to some Catholic prince or state; or a person who attends, on the pope's behalf, at a congress, or an assembly of several ambassadors.

The word *nuncio* has the same import with ambassador; but is restrained, in its use, to the ambassadors of popes alone; as that of *internuncio* is to their envoys extraordinary.

The *nuncio* has a jurisdiction, and may delegate judges, in all the states where he resides, except in France, where he has no authority, but that of a simple ambassador.

NUNCUPATIVE, in the *Schools*, a term used to express something that is only nominal, or has no existence but in name.

Felix of Urgel maintained, that Jesus Christ, as man, was only God *nuncupatively*, *i. e.* nominally. Alcuin, in his answer to Felix, maintains, that it is to fall into Nestorianism, to distinguish two sons of God in Jesus Christ, the one natural, the other adoptive; and two Gods, the one real, the other *nuncupative*.

NUNCUPATIVE Will denotes a last will or testament only made verbally, or *viva voce*, and not put in writing. See **WILL** and **TESTAMENT**.

NUNDAVERAM, in *Geography*, a town of Hindoostan, in the Carnatic; 8 miles E.S.E. of Udeghery.

NUNDINAL, **NUNDINALS**, a name which the Romans gave to the eight first letters of the alphabet, used in their calendar.

This series of eight letters, A, B, C, D, E, F, G, H, is placed and repeated successively from the first to the last day of the year: one of these always expressed the market-days, or the assemblies called *nundinae*, *quasi novendinae*, because they returned every nine days.

The country people, after working eight days successively, came to town the ninth, to sell their several commodities, and to inform themselves of what related to religion and government.

Thus, the *nundinal* day being under the letter A on the 1st, 9th, 17th, and 25th days of January, &c. the letter D will be the *nundinal* letter of the year following. These *nundinals* bear a very great resemblance to the dominical letters, which return every eight days, as the *nundinals* did every nine.

NUNDUNGOTCHY, in *Geography*, a town of Bengal; 10 miles E.S.E. of Bouleah.

NUNDUNGUR, a town of Hindoostan, in Bahar; 25 miles E.N.E. of Durbungah. N. lat. $26^{\circ} 12'$. E. long. $86^{\circ} 32'$.

NUNDYDROOG, a town and fortrefs of Hindoostan, in Myfore, the capital of a considerable district, built on the summit of a mountain, 1700 feet high, and in most parts of it inaccessible; which was besieged and taken by the British troops in 1792; 65 miles N. of Seringapatam.

NUNEATON, a market-town and parish in Atherstone division of the hundred of Hemlingford, county of Warwick, England, is situated on the river Anker, at the distance of 9 miles N.N.E. from Coventry, and 104 N.W. by W. from London. The river divides the town into two parts; and close to it, on the west side, passes the canal which connects the town of Coventry with the Grand Trunk Navigation. This place was originally simply denominated Eaton, signifying the town on the rivulet, and seems to have

been a considerable village previous to the Norman era. The addition *Nun* was derived from the monastery for Benedictine nuns, founded here in the reign of king Stephen by Robert Bosu, earl of Leicester, whose countess, Amicia, took the veil in it, and at her death was buried in the church. Some fragments of the walls of the ancient buildings of this monastery are still standing at the north-west end of the town; but they are too trifling to convey any idea of the extent or grandeur of the foundation, in the time of its prosperity. No doubt, however, exists of its riches and magnificence; as it is recorded to have had large possessions in different counties, besides the patronage of several churches, which were granted to it by pope Boniface and William, earl of Gloucester. At the dissolution, it was surrendered to the king, who bestowed the site on sir Marmaduke Constable.

Nuneaton is a town of considerable extent, and has been on the increase ever since the opening of the canal. According to the population returns of 1811, it contained 1101 houses, and 4947 inhabitants. The market was first established here in the 7th year of the reign of Edward II., by a charter from that prince, granted at the request of the nuns, who were afterwards empowered by special patent to "take toll of all vendible commodities coming thither by the space of five years, towards the expence of paving" the town. The market is held on Saturday weekly, and there are three fairs during the year. A very considerable ribbon manufactory is carried on here. A free-school, founded by the inhabitants in the time of Edward VI., is still supported. The church is dedicated to St. Nicholas, and is a very ancient structure, with a square tower at the west end, but is not remarkable for its architecture. It contains, however, several curious monuments, and, among others, that of sir Marmaduke Constable, whose death happened in April 1560.

About two miles from Nuneaton the Watling-street crosses the northern division of the county, and forms, for some miles, the boundary between it and Leicestershire. On this part of its course was the station Manduessedum, now called *Mancester*, where many Roman coins of brass and silver have been dug up. The church belonging to this village stands on an eminence, supposed by Stukely to have been the site of an ancient camp, as one side of it is deeply entrenched; and to the left of the church are the remains of an ancient fortress, or encampment, called Oldbury. It is of an oblong form, and surrounded with large ramparts, which inclose an area of seven acres. Dugdale thinks that this work was originally constructed and occupied by the Britons, as many stone-axes or celts are frequently discovered within its boundaries. About two miles to the north-west of Nuneaton is Arbury-hall, the seat of Francis Newdigate, esq., who has a coal-mine here, whence a cut is made to the Coventry canal. In the parish of Chilvers-Cotton, on the same side of the town, are the ruins of the monastery of Erdburie, which was founded by Ralph de Sudley, in the reign of Henry II., for canons regular of the order of St. Augustine. The *Antiquities of Warwickshire*, &c. by Sir William Dugdale, 1 vol. folio, London edit. 1656. Camden's *Britannia*, by Gough, vol. ii.

NUNEGAN, a small island in the Frozen ocean. N. lat. $67^{\circ} 40'$. E. long. $193^{\circ} 40'$.

NUNEZ, ALONZO DE CASTRO, in *Biography*, chronicler to Philip IV. of Spain, a writer who lived in the worst age of Spanish literature, and who continued the "*Corona Gotica y Austrica*," which Diego de Saavedra Faxardo began, and wrote several other works. Gen. Biog.

NUNEZ, DUARTE DE LIAM, or LEAO, a Portuguese historian,

historian, topographer, and grammarian born in the city of Evora, in the latter end of the 16th century. He wrote upon the origin and orthography of his mother tongue, a description of Portugal, and a dissertation of the kings of Portugal. His principal works were the "Primeira Parte das Chronicas dos Reis de Portugal, reformadas," corrected and put in order from the chronicle of Fernam Lopez, Recy de Pina, and Duarte Galvam. After the Braganzan revolution, Nunez proceeded with his labours, under the patronage of D. Rodrigo da Cunha, archbishop of Lisbon, and he abridged other chronicles of his countrymen. This work appeared in folio, 1643, three years after the Portuguese had thrown off the yoke of the Spaniards; and no publication could have been better timed than this history of the glorious and successful resistance which their forefathers had made against the same enemies. In the ensuing year, our author's bookfeller, Antonio Alvarez, printed the original chronicle of Joam I.; and thus the late compilations lost the greater part of their interest. The other originals remained in manuscript till the year 1790, when the Royal Academy of Lisbon published them. Gen. Biog.

NUNEZ, FERNAN DE GUSMAN, was born at Valladolid, and became a knight and commendador of the order of Santiago. Notwithstanding this decision with regard to a military life, his inclination led him to letters instead of arms. With the view of pursuing literature, he went into Italy, and there studied Greek and Latin under Beroaldus, and Jovian the Greek refugee. As yet Greek learning had not found its way into Spain. D. Inigo Lopez de Mendoza is said to have profited greatly by the society of Fernan Nunez, who acted as preceptor to his son. When cardinal Ximenes founded the university of Alcalá, he and Demetrius the Cretan were appointed Greek professors; and in the famous Polyglot, which, it has been said, would immortalize the name of Ximenes better than all his actions as a statesman, the task of preparing a Latin version from the Septuagint was entrusted to them and to Lopez de Astuniga. Nunez had retired from all the common and unworthy objects of ambition, but his pursuits as a literary man had fostered in him a love of liberty; and in the struggle which the commons of Castile made against the growing tyranny, which has since been so fatal to their country, he lent what aid he could to their efforts, and endeavoured to win the people of Alcalá to their cause. A young man, to whom he had promised great pecuniary rewards for his assistance, when the insurgents were suppressed, attacked him, because this money could not be paid, and wounded him in the arm. The aggressor was too powerful, and the cause of the dispute of too serious a nature for Nunez to seek redress: he, therefore, left the university, and removed to Salamanca. Here he was appointed Greek professor, teaching Greek in the forenoon, Latin in the afternoon, and reading lectures upon rhetoric, and upon the natural history of Pliny. Thus he passed the remainder of his life, till the year 1553, when he died, leaving his valuable library to the university of Salamanca. To him has been assigned the first place among the restorers of classical learning in Spain. He is highly celebrated by various authors, from some of which we shall make a short extract or two. Lipsius bestows on him very high commendation, remarking, at the same time, how little his celebrity was proportioned to his deserts. He describes him, "Non præceps, acutus tamen, et sagacitate ac modestiâ pari." His life, says Mr. Southey, seems to bear inspection, as well as his learning; and he is characterized by Nic. Antonio, "Cœlebs, castus, comis, festivè dicax sed innocuè, vitiorumque reprehensor accerrimus." His

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published works, besides the part which he bore in the Polyglot, are, 1. "Annotationes in Senecæ Philosophi Opera." 2. "Observationes in Pomponium Melam." 3. "Observationes in loca obscura et depravata Historiæ Naturalis C. Plinii, cum retractationibus quorundam locorum Geographiæ Pomponii Melæ, locisque aliis non paucis in diversis utriusque Lingue auctoribus castigatis et expositis." 4. "Glossa sobre las obras de Juan de Mena." 5. "Refranes y Proverbios Glossados." His occupations and growing infirmities, says his biographer, "prevented him from completing this work, as he intended: he was remarkable for the happy use of proverbs, and this book would doubtless be found of considerable use to the annotators of Don Quixotte." Gen. Biog.

NUNEZ, PERO. See NONIUS.

NUNEZ, in *Geography*, a town of Spain, in the province of Cordova; 7 miles N.N.W. of Montella.—Also, a river of Africa, called *Nuno*, which separates the Nalos from the Sierra Leone, and runs into the Atlantic, N. lat. 10° 20'. W. long. 13° 50'.

NUNNI, the Grecian lullaby, or song peculiar to nurses. See SONG.

NUNNORE, in *Geography*, a town of Hindoostan, in Bahar, on the Soane; 15 miles S. of Arrah. N. lat. 25° 20'. E. long. 84° 49'.

NUNO PEREIRA, a small island in the East Indian sea, near the E. coast of Madagascar. S. lat. 13° 50'.

NUNO Triflao, a river of Africa, which runs into the Atlantic, N. lat. 9° 40'.

NUNSARA, a town of Hindoostan, in Guzerat; 16 miles S. of Surat.

NUNTIO. See NUNCIO.

NUPER OBIT, in *Law*, a writ which lies for a coheir-ess being deforced by her coparcener of land or tenements, whereof their common father or ancestor died seised in fee-simple.

If the ancestor died seised in fee-tail, the coheir-ess deforced shall have a formedon.

NUPHAR, in *Botany*, νύμφη of the Greeks, the Yellow Water Lily, or νύμφη αλλη of Dioscorides, from the flowers of which was anciently prepared a cooling drink called νύμφιον. The Turks, according to Dr. Sibthorp, still make one of their kinds of Sherbet, or Sorbet, from these flowers, which give a kind of bitter almond flavour to the liquor in which they are infused. The modern Greeks call the plant νύμφη, or νύμφη, of which its Turkish name, *Pußer ciceghi*, seems a wide corruption, and the French one, *Nenuphar*, scarcely an alteration.—Smith Prodr. Fl. Græc. v. 1. 361. Dryand. in Ait. Hort. Kew. ed. 2. v. 3. 295. (Nymphæa; Lamarck Illustr. t. 453. f. 2. Gærtn. t. 19. lutea. Salis. in Ann. of Bot. v. 2. 71.)—Class and order, *Polyandria Monogynia*. Nat. Ord. *Hydrocharides*, Juss. *Nymphaeæ*, Salis. an order intermediate between the *Ranunculaceæ* and *Papaveraceæ* of Jussieu.

Gen. Ch. Cal. Perianth inferior, of five or six large coloured, rounded, concave, permanent leaves. Cor. Petals numerous, smaller than the calyx, obtuse, recurved, with nectariferous furrows at their back. Stam. Filaments very numerous, inserted into the receptacle, about as long as the petals, flat, spreading; anthers oblong, on the upper side of each filament, opening by two linear fissures above. Pist. Germen superior, large, ovate; style none; stigma orbicular, peltate, radiated above, its margin entire or notched, permanent. Peric. Berry ovate, with a coriaceous coat, internally spongy, with numerous cells. Seeds very numerous, roundish, polished.

Eff. Ch. Calyx of five or six leaves. Petals numerous, bearing

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bearing honey at their backs, inserted with the stamens into the receptacle. Stigma with radiating furrows, sessile. Berry superior, of many cells. Seeds numerous.

1. *N. lutea*. Common Yellow Pond-Lily, or Nuphar. Sm. Prodr. Fl. Græc. v. 1. 361. Ait. n. 1. (Nymphæa lutea; Linn. Sp. Pl. 729. Willd. Sp. Pl. v. 2. 1151. Engl. Bot. t. 159. Fl. Dan. t. 603. Matth. Valgr. v. 2. 246. Camer. Epit. 635. Ger. em. 819. Fuchf. Hist. 536. Nenuphar prima; Brunf. Herb. v. 1. 36.)—Calyx of five leaves. Margin of the stigma entire. Footstalks two-edged. Lobes of the leaves close together.—Native of ponds, lakes, and gentle rivers throughout Europe. Dr. Sibthorp met with it in the lakes of Thessaly, where it is said by Dioscorides to grow. It flowers copiously with us in June and July. The roots are perennial, deeply fixed in the mud, of a firm, almost woody, substance, white and farinaceous within. Leaves radical, numerous, floating, elliptical, entire, smooth, single-ribbed, with a furrow above; deeply divided at the base into two slightly angular lobes, which fold over each other. Footstalks various in length according to the depth of the water, two-edged, flat above, convex beneath. Flower-stalks radical, simple, cylindrical, each bearing one flower, about two inches wide, raised above the water, of an uniform golden yellow in every part, except some tints of orange on the petals, and of green at the back of the calyx. These flowers are vulgarly termed in Norfolk Brandy-bottles, from their scent, which partakes of brandy or ratafia. Each ray of the stigma answers to a cell in the berry. The seeds are farinaceous, resembling millet, but larger.

2. *N. minima*. Least Pond-Lily, or Nuphar. Sm. Engl. Bot. t. 2292. (Nymphæa lutea β , minima; Willd. Sp. Pl. v. 2. 1151. N. parva; Matth. Valgr. v. 2. 247.)—Calyx of five leaves. Stigma toothed. Footstalks two-edged, nearly flat. Lobes of the leaves rather distant.—Discovered by Mr. W. Borrer, in the lake of the Highland mountain of Ben Cruachan. Professor Willdenow informs us it has been observed in the duchy of Mecklenburgh, as well as in Prussia and Bohemia. This is most indubitably a distinct species from the last, differing not only in its much smaller size, the flower not being above half so big, but more essentially in its deeply-toothed green-bordered stigma, and compressed footstalks. The leaves are somewhat silky beneath, and their lobes rather distant or divaricated.

This may be *Nymphæa lutea minor parvo flore*, Loes. Pruss. 178, but it is certainly not *N. lutea minor septentrionalium*, Lob. Ic. 595, which is *Menyanthes nymphæoides*.

3. *N. Kalmiana*. Canadian Pond-Lily, or Nuphar. Ait. n. 2. (Nymphæa Kalmiana; Sims in Curt. Mag. t. 1243. N. lutea β , Kalmiana; Michaux Boreal-Amer. v. 1. 311. N. lutea e Canada; Linn. Sp. Pl. 729.)—Calyx of five leaves. Stigma toothed. Footstalks semicylindrical. Lobes of the leaves rather distant; their veins furrowed beneath.—Kalm and Michaux have observed this in Canada. Messrs. Loddiges introduced it here in 1807. We received a specimen from our worthy friend Mr. W. Anderson, who raised it in Mr. Vere's garden at Knightsbridge. This species flowers from June to August; and is most akin to the last in size, but the leaves are more rounded and obtuse, their stalks not flattened, their veins furrowed beneath, and somewhat prominent above. Flowers of a golden yellow, with a purplish, not green-bordered, stigma, similarly toothed at the edge.

Mr. Anderson remarks (see *Curt. Mag.*) that this, as well as the *lutea*, "besides the leaves which float upon the water, bears others which never appear above its surface;

these are tenderer, more undulated, and shorter, with lobes very much divaricated, and hence approaching to kidney-shaped."

4. *N. advena*. Three-coloured Pond-Lily, or Nuphar. Ait. n. 3. (Nymphæa advena; Ait. ed. 1. v. 2. 226. Willd. Sp. Pl. v. 2. 1152. Hort. Berolin. t. 38. Sims in Curt. Mag. t. 684.)—Calyx of six leaves, in two rows. Stigma undulated. Footstalks nearly cylindrical. Leaves heart-shaped, with spreading lobes. Fruit furrowed.—Native of North America, introduced into England by Mr. William Young, in 1772. It is hardy, flowering in June, as we have seen it in Sir Joseph Banks's pond at Spring-grove, near Hounslow. This is the size of our common *Nuphar lutea*, but the leaves approaching towards a triangular form, with distant lobes, somewhat of a terminal point, and almost cylindrical footstalks, distinguish it. The flowers too differ in the dark purple inside of their three outer calyx-leaves, one of which indeed occasionally, but not always, assumes some of the dilated form, and yellow colour, of the three inner ones. The petals are concealed by the very numerous, recurved, crimson-bordered anthers. The stigma is yellow, with a wavy, or bluntly crenate, edge. The berry is said to be furrowed longitudinally. If this species was more free in flowering, it would make an agreeable variety in ponds among the common kind.

5. *N. longifolia*. Long-leaved Pond-Lily, or Nuphar. (Nymphæa longifolia; Michaux Boreal-Amer. v. 1. 312. N. sagittifolia; Walt. Carolin. 155.)—Calyx of six leaves in two rows. Stigma undulated. Leaves oblong, wavy, arrow-shaped, with abrupt approximated lobes, at the base.—Native of North and South Carolina, according to Michaux, whose description however accords but ill with a specimen communicated to us by Dr. Delile from that country, by which the leaves do not appear to be obtuse, neither are the petals wanting, nor the anthers nearly sessile. The leaf in ours is near a foot and a half long, and from three to four inches broad, wavy at the edge; its termination, though injured, appears evidently to have been acute; the base is extended into two small lobes, one inch and a half long, folding over each other, oblong, angular, and obtuse. Flower nearly the size of the last. Three outer leaves of the calyx green, elliptical; three inner much larger, rounder, almost entirely yellow. Petals wedge-shaped, the length of the outer stamens, and concealed by them. Stigma with numerous elevated rays, its margin slightly wavy. All the organs of impregnation are yellow, the anthers much paler than the rest, and almost white; their length about equal to the filaments, their lobes or cells tumid.

NUPTIAL, something that relates to marriage.

NUR, in *Geography*, a town of Grand Bucharia, situated on a mountain, and so called from *Nur*, light, because it contained a number of holy places, whither devotees resorted: it was taken by Jenghiz Khan in 1211; 100 miles N.E. of Bokhara. N. lat. 40° 15'. E. long. 63° 50'.—Also, a town of the duchy of Warsaw; 50 miles E.N.E. of Warsaw.

NURA, a river of Russia, which runs into the Kargaldzin lake, N. lat. 51° 44'. E. long. 68° 44'.—Also, a river of Italy, which runs into the Po, 6 miles N.E. of Piacenza.

NURABAD, a town of Hindoostan, in the circar of Gohud; 20 miles W. of Gohud.

NURAQUIMIRE, a town of Hindoostan, in the province of Tatta; 48 miles S.S.E. of Tatta.

NURDIJA, a town of Persia, in Khorasan; 30 miles S. of Neisapour.

NUREM-

NUREMBERG, an imperial city of Germany, in the circle of Franconia, anciently called "Mons Noricorum," made free by the emperor Frederic Barbarossa. It is large and well built, though not populous, situated on a sandy spot, well cultivated and fertile, and rendered pleasant by the villages and country spots that are adjacent; the river Pegnitz runs through the town, and it is here traversed by a number of wooden and stone bridges. The town is encompassed by double walls, fortified by several towers, and guarded by a ditch of about a German mile in circuit. Its streets are about 500, and its houses 8000, but the number of inhabitants is very disproportioned to the extent of the town. The magistrates and inhabitants are chiefly Lutherans; besides two parochial churches, it contains 15 other places of worship. The town is divided into 8 parts, and 131 captainships; in one of the parts is situated the imperial fortress, constructed in an old-fashioned style, and placed on a mountain, where the first counsellor, as imperial bailiff and castellan, was accustomed to reside. The council-house is one of the most magnificent in Germany, and in its apartments are several curious paintings; and the council consists of 34 noble and 8 handicraft counsellors. The military force of the town consists of seven companies of foot, and two companies of cuirassiers, &c. Several of the inhabitants have acquired considerable reputation in the arts of painting and engraving; and many of its artists have distinguished themselves by works in ivory, wood, and metal, which are widely circulated. Nuremberg is one of the principal trading towns in Germany. The adjoining territory, called the circle of Nuremberg, is considerable; 78 miles E.S.E. of Mentz. N. lat. 49° 28'. E. long. 11° 1'.

NURHUA, a town of Hindoostan, in Bahar; 28 miles N.W. of Chuprah. N. lat. 26° 0'. E. long. 84° 20'.—Also, a town of Hindoostan, in Bahar, on the Dewah; 50 miles N.W. of Patna.

NURI, a town of New Mexico, in the province of Hiaqui; 40 miles S.E. of Riochico.

NURJEE, a town of Sewestan; 25 miles N. of Schwan.

NURMIJARVI, a town of Sweden, in the province of Nyland; 20 miles N.N.W. of Helsingfors.

NURMIS, a town of Sweden, in the government of Kuopio; 58 miles N.E. of Kuopio.—Also, a small island, on the E. side of the gulf of Bothnia. N. lat. 61° 12'. E. long. 21° 10'.

NURMO, a town of Sweden, in the government of Wafa; 36 miles E.S.E. of Wafa.

NURMS, a town of the duchy of Courland; 28 miles E. of Goldingen.

NURPUR, or **NOORPOUR**, a town of Hindoostan, and capital place of a district, in the subah of Lahore. It is situated on the top of a hill, which is ascended by some steps, and has the appearance of opulence and industry. The district is mountainous; its revenues amount to 40,000*l.*; and it is less molested than the contiguous principalities by the oppressive incursions of the seiks; 70 miles N.E. of Lahore. N. lat. 32° 12'. E. long. 75° 5'.

NURRAH, a town of Hindoostan, in the circar of Ruttunpour; 20 miles E. of Naypour.

NURSERY, in *Agriculture* and *Planting*, the name of a place appropriated for rearing and preserving young plants of different kinds. Every gentleman who has any extent of land to be planted should have a place of this sort for raising his young trees and plants, as it saves a great deal of trouble and expence which must otherwise be incurred in providing them.

Mr. Boucher states, that it is an almost universally received opinion, that trees ought to be raised in the nursery on a poorer soil than that to which they are afterwards to be transported for good, and it has been directed by many, otherwise the most respectable authors. He must acknowledge this doctrine has a very specious appearance at first view. He adhered to it early in life, and it is so seemingly consistent with nature, that he is not surprised it has been generally adopted by young planters, at the same time he cannot account for those who have had much practice and long experience not exposing the errors of it. And he adds, that he has given some examples, from frequently repeated experiments, of the ill effects he has felt by planting young and tender seedlings in the poorest soils, and the greater success attending those that were well-grown on the same, or in similar situations. The consequences of raising plants on poor hungry land are no less fatal than planting the seedlings in such, and should as much as possible be avoided. He has mentioned in the culture of many trees, the necessity of promoting their vigorous growth at first, in order to their becoming stately and handsome; nor can this be effected by any other means than being early nursed in a generous soil; for whatever future purpose they are meant, or to whatever situations they are destined; and that, if they are but barely supported from infancy on meagre ground they will never afterwards become strong, though removed to that which is rich and feeding. Farther, that he has sown the seeds of forest trees on the poorest ground, planting seedlings, and strong well-nursed trees from ten to five feet high, on the same ground and at the same time, where the old well cultivated plants have frequently made good trees, when the seedlings have perished, and from the sterility and coldness of the soil, the seeds have not so much as vegetated. In short, the roots of seedlings are not so well fitted as larger plants to draw sufficient nourishment from crude, rank, and uncultivated soils: and as he has truly found what is here said in many instances to be the case, he is obliged to believe that the general practice of planting seedlings in poor, and large trees in good land, should be quite reversed.

It has also been stated by others, that almost all writers on agriculture advise the farmer to be very careful to make choice of such plants only as have been raised in a nursery of poor soil, and always to reject such as have been reared in a richer soil than that in which he is to plant them: because, a plant which has been reared in a barren soil has been inured, from its infancy, to live hardily, and will advance with a great degree of luxuriance, if it is planted in one that is better: whereas a plant that has been nursed in a fertile soil, and has certainly rushed up to a great size, like an animal that has been pampered with high feeding, and swelled up with fat, will languish and pine away, if transplanted to a more indifferent soil. But it would be no difficult matter to shew the fallacy of this mode of reasoning, and to point out many errors which have crept into almost all sciences, from pursuing such fanciful analogies between objects in their own natures so different, as in this example. But as this would be in some measure foreign to the purpose, it may just be noticed, that it could seldom be attended with worse consequences than in the present case, as it leads to a conclusion directly the reverse of what is warranted by experience. For it has been found, from reiterated experiments, that a strong and vigorous plant, that has grown up quickly and arrived at a considerable magnitude in a very short time, never fails to grow better after transplanting, than another of the same size that is older and more stunted in its growth, whether the soil in which they are planted be rich or poor: so that, instead of

recommending a poor hungry soil for a nursery, it would perhaps in all cases be best to set apart for this purpose the richest and most fertile spot that could be found; and in the choice of plants, always to prefer the youngest and most healthy, to such as are older, if of an equal size. This is given as the result of much experience in this business. And the practical planter suggests, that so much has been said concerning the question, whether a nursery should be on a soil, and in a situation corresponding to those on which the trees are ultimately to be planted, that he should deem it unpardonable to pass the subject in silence. He briefly delivers his own opinion, so that the reader may apply or reject what agrees with, or stands opposed to his. But he first remarks, that experience has taught him that it is only for an extensive scale of planting that the nursery can be had recourse to; in other cases it is no saving for a gentleman to rear a nursery. He confines himself to the nursing of *seedlings only* on the same principle; and from indisputable proofs, demonstrated both by himself and others, who have had much experience, made impartial trials for ascertaining how far it might be to a gentleman's advantage to rear his own nursery from seed. And they have all found it unprofitable, and attended with considerable perplexity. A thing not at all to be wondered at, when we reflect on the multiplicity of business at that season most critical, for insuring success in this branch. If the soil and situation whereon the trees are ultimately to be planted be good, or nearly resemble what is described below; then, if all other circumstances concur, he conceives the trees ought to be nursed on the spot; but for no other reason than that it is less expensive to carry to a distance seedling, than transplanted trees. But if the soil whereon the trees are to be planted be bad, or essentially different from that he is about to describe, and if the situation be bleak, and exposed to violent winds, then he should conceive the attempt to rear nursery plants clean, healthy, and well-rooted, opposed to common sense. And after stating that great care and attention is requisite in rearing young plants; that some are raised with more difficulty than others; it is asked "are the ash, the beech, the birch, the elm, the larch, and the oak, reared in *infancy* with equal ease? Do they not, if properly treated, all equally flourish afterwards on the mountain, in the vale, where soil is hardly found, and where it is found in abundance? Do we sow seed in sand, gravel, clay, the crevice of a rock, on the bleak top of a mountain, or in a fertile vale, with equal expectation of seeing it rise a good plant?"

Soil proper for.—That which is supposed by Mr. Nicol as the best suited for this purpose, is a loam of a middling texture, rather inclining to sand, neither rich nor poor, from eighteen to twenty-four inches in depth; lying on a free, porous substratum; as this will be found more generally congenial to the nature of the different forest trees than any other soil. But there is no general rule without exception. If there be a diversity of soils, and if they do not too nearly approach the extremes of meagre sterility and excessive fertility, so much the better, since all the kinds do not exactly thrive alike in the same soil; and an opportunity would thereby be afforded of placing each in that congenial to its nature. The site should neither be high nor low, sheltered nor exposed, in any extreme, for the same reason, *viz.* that it may the more generally answer all purposes. For a nursery of this description, nothing can be more eligible than the spot which may occasionally be occupied as a kitchen garden. The pulverization and mellowness afforded by the previous growth of various culinary crops, bring the land into the most suitable state for the raising of

young trees, and at the same time clear it the most effectually from vermin, as the grub and other insects. And in all cases, it will be advisable to trench the ground to its full depth, in preparing it for a nursery; and if necessary, to give it a dressing with lime, marle, dung, &c. *in compost.* Other manure should never be applied to nursery ground at the time of cropping with timber trees. But at the time of cropping with esculents, manure, either simple or in compost, may be applied; as convenience and the nature of the crop in question shall determine. But that the trees should immediately follow a manured culinary crop, is the best of all methods; as in that case, no manure would be required for the timber crop. He has known an instance, where a field was taken in for a nursery, from an old pasture of rough sward, and in which myriads of the grub-worm, slug, &c. had found an asylum. It was conceived, that by subtrencing, or deeply digging it, the land might be effectually cleaned; and accordingly the field was planted with nursery plants, without any preparatory crop of grain, &c. But the result was, that most of the firs, the larches, the elms, the beeches, &c. became a prey to the vermin the ensuing season; and their stems were found peeled entirely round, about an inch under the surface. For this reason, it becomes a matter of caution, that a like misfortune be avoided, to take a crop, or crops, of grain, potatoes, turnips, &c. in order to thoroughly cleanse the soil of these noxious vermin, before venturing in it the more valuable crop of the nursery. But, in respect to the proper rotation, much must be left to the judgment of the operator and existing circumstances. The following example is given on the supposition that it may be applied, or partly rejected, according to the exigency of the case. 1st. Vegetables, with manure; winter fallow. 2d. Evergreen and resinous trees, without manure. 3d. Subtrenched; deciduous trees, ditto, ditto. 4th. Potatoes or turnips, with manure. 5th. Evergreen and resinous trees, as before, &c.

However, for the extensive plantations of the duke of Portland, in Nottinghamshire, where the soil is of a light sandy kind, some well-situated valley is usually chosen, as near the centre of the intended plantations as possible, for the purpose of a nursery. If this valley is surrounded with hills on all sides but the south, so much the better. A piece of ground, consisting of as many acres as is convenient for the purpose, is fenced about in such a manner as to keep out all noxious animals. At each end of the nursery large boarded gates are fixed, and also a road made down the middle wide enough to admit carriages to go through, which is found exceedingly convenient in removing the young trees from thence to the plantations. After the fence is completed, the ground on each side the road is trenched about twenty inches deep, which may be done for about 3*l.* 10*s.* or 4*l.* an acre, according as the land is more or less gravelly. It is best done in the spring, when the planting season is over. If after the trenching two or three chaldrons of lime be laid on an acre, the land will produce an excellent crop either of cabbages or turnips, which, being eaten off by sheep in the autumn, will make the land in fine order for all sorts of tree-feeds: but as the oak is the sort of tree cultivated in general, this is the method pursued in raising and managing that most valuable species.

Culture of the Plants.—As soon as the acorns fall, after being provided with a good quantity, sow them in the following manner: Draw drills with a hoe in the same manner as is practised for pease, and sow the acorns therein so thick as nearly to touch each other, and leave the space of one foot between row and row, and between every fifth row the space of two feet for the alleys. While the acorns are in the

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ground, great care must be taken to keep them free from vermin, which would very often make great havoc amongst the beds if not timely prevented. Let this caution serve for most other sorts of tree-seeds. As soon as the acorns are come up, the beds require only to be kept clean from weeds till they want thinning; and as the plants frequently grow more in one wet season where the soil is tolerably good, than in two dry ones, where the soil is indifferent; the time for doing this is best ascertained by observing when the tops of the rows meet; which is done, when that is the case, by taking away one row on each side the middlemost, which leaves the remaining three rows the same distance apart as the breadth of the alleys. In taking up these rows, the workman ought to be careful neither to injure the plants removed, nor those left on each side. The rest of the young oaks being now left in rows at two feet apart, let them again stand till the tops meet; then take up every other row, and leave the rest in rows four feet asunder, till they arrive to the height of about five feet; which is full as large a size as is ever wished to be planted. In taking up the two last sizes, the method is to dig a trench at the end of each row, full two feet deep; then undermine the plants, and let them fall into the trench with their roots entire: the same mode is necessary with other sorts of trees, very much of their future success depending on this point, of their being well taken up.

But Mr. Nicol does not nurse trees in general more than two seasons; as they are either one or two years in the seminary, according to their kinds, before they come under view; and as the after-treatment for many kinds is the same, for the sake of brevity, he classes such as with propriety may be classed together, and whose culture in the nursery is similar; particularising those only that are of the greatest importance, and whose treatment is materially different. He advises that the alder and the birch should remain two years in the seminary, and then be removed into nursery rows. The richest and choicest ground in the nursery, provided it be of such soil, and in such situation as is described above, should be allotted for them. They are to be planted in lines twelve inches asunder, and about four inches in line. The roots of the alders may be trimmed a little with the knife. The birches must not be touched. And he adds, that whether plants should be put in with the spade or setting stick, is a question frequently agitated. He is of opinion it is a matter of little importance to plants of this age, which method is practised, provided either be well performed. The size of the roots should determine. But it would certainly be improper to force a large root into a small hole, to the evident detriment of the plant, by its roots and fibres being bundled together in a mass, without the intervention of mould. It is equally improper to force a plant into a slit or gash, whose sides, by the operation of making it, are hardened and rendered impenetrable, in a great measure, by the tender fibrils for a time, until rain, and the influence of the weather, soften them. He, therefore, for the better performance of both methods, would advise, first, for dibbling; that the ground be well broke in the operation of digging or trenching; that whatever is dug be also planted the same day, that it neither be dug nor planted in too wet or too dry a state; that the hole be made large and loose by a twitch of the hand; that the plant be just sufficiently fastened to keep it in proper position; and that, at the end of each day's work, the whole be levelled, and the earth closed to the stems with a short-headed rake: 2d, for laying in with the spade; that (instead of digging over the ground first, and then planting in a slit or gash, whereby the sides of the slit are hardened, and

the roots crowded in,) the digging and planting be both carried on together; that is, turn one furrow farther than where the row is to be placed, cut perpendicularly by the line; place in the plants; turn another furrow to their roots; turn a second, or, if necessary, a third furrow; cut and place as before, &c.: treading none, but smoothing all with the rake. Farther, the ash and mountain forb should also remain two years in the seminary. The poorest soil in the nursery should be their portion, reserving better for the kinds to follow. They should also be planted in lines twelve inches asunder, and four in line: the roots of both being moderately trimmed with the knife. The beech and the oak are also to remain two years in the seminary, and should be planted in good soil, in lines fifteen inches apart, and five or six in line. Their roots on no account to be trimmed at this time; otherwise not one-half of the plants will strike. They should remain for two seasons in this situation; at the end of the first, let their tap roots be cut at the depth of six inches below the surface, a person cutting on each side the row, with a spade sharpened on purpose, so as to effectually cut the tap root of each plant, with as little injury to the upper part as possible, then pointing up the intervals of the rows, levelling all to the stems of the plants. It is supposed, that at the end of the second season the plants will have made fibry roots, and be fit for removal to almost any situation. But, if for any particular purpose it be necessary to nurse them longer, in that case they should be transplanted next season into fresh nursery rows; allowing them a little more room, and shortening all roots which have a tendency downwards. The common chestnut, and the horse-chestnut, should also stand two years in the seminary, and any part of the nursery will suit them. They should then be planted in lines fifteen inches apart, and four or five in line. Their roots may be gently pruned. They should stand two or three seasons, according to their progress in this situation. Being chiefly ornamental plants, and designed for the less untoward situations, they are frequently required of larger size. If so, at the end of the second season, they should be moved and planted into rows eighteen or twenty inches apart, and eight or nine inches in line; previously shortening all the roots that tend downwards, and tapping as advised above, for beech and oaks. But the elm, the hornbeam, and the sycamore, are sometimes removed from the seminary at one, and sometimes at two years old; he prefers the latter, planting them in lines at twelve inches apart, and four in line. The roots may be gently pruned if needful. And at the end of the second season they will be fit for removal to any situation, where soil to the depth of four inches is found; but if intended for more barren soils, they should be removed at the end of the first year.

In respect to the larch, it should never remain more than one season in the seminary. Mr. Nicol is convinced of this from having made a variety of experiments for ascertaining the quickest and most advantageous methods of rearing this useful tree. And the result of these experiments has proved to his entire satisfaction, that a healthy seedling of one year, also nursed one year, in moderately good soil, having a sufficiency of room, and kept properly clean of weeds, will, in any soil or situation wherein it may afterwards be placed, outgrow another of any age within the seventh year after transplanting. He has planted many of this description, and within that period has measured them fifteen feet in height; while those on the same spot, planted the same day, and which were, some two, some three years nursed, did not measure above twelve feet, nor were so straight or beautiful in their forms.

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The progress of this plant, in infancy, has been found to follow in this course on all soils where he has made the experiment; and these have been very different in quality and depth:

One-year seedling.	One year nursed.
Ditto ditto.	Ditto, removed, and nursed a second year.
Ditto ditto.	Nursed in the same row two years.
Two-year seedling.	One year nursed.
Ditto ditto.	{ Ditto, removed and nursed a second season.
Ditto ditto.	Nursed in the same row two years.
Ditto ditto.	Ditto for three years.

It is here asked if this be the case, may we not also suppose, that since the first outgrows the others in infancy, and on good soil, it will continue to surpass them on bad and shallow soils; since, by reason of its small size, it could be more effectually planted? Whether of the two would be most apt to suffer by inclement weather, and consequently soonest get stunted? It is, therefore, recommended that the plants be taken from the seminary at one year old, and nursed one year, in rows twelve inches apart, and four in line. If plants of a greater size be wanted, they should be moved at the end of one, and nursed another year, in rows fifteen inches apart, and six in line. Beyond this, the larch should never be nursed. The infant tap roots may be shortened a little; but after this they should not be pruned at all in any case.

With regard to the Scotch fir and the Weymouth pine, the former, unless for the purpose of decoration, or where it is wanted for variety, is never nursed, but taken from the seminary at two years old, and then planted out for good. Mr. Nicol approves of this practice, provided the plants stand thin in the seminary; but otherwise they should be nursed one year in rows a foot asunder, and an inch in line. If they are required of a larger size, they should be removed from this into other nursery lines, at twelve or fifteen inches apart, and four or five in line, according to the time they are to remain there, which, however, should not be longer than two years for any purpose whatever. The Weymouth pine should also stand two years in the seminary, and then be nursed two or three years in rows; according to the purpose intended, or the quality and depth of soil wherein it is afterwards to be planted. In either case, fifteen inches between the lines will be sufficient; and if they are to remain two years, four in line; but if three, five or six. The tap roots of the seedlings of either may be shortened a little; but at the second, or any subsequent removal, their roots must not be touched.

But the common or Norway spruce should be removed from the seminary at two years old, and nursed in lines twelve inches apart, and three in line, for two seasons: at the end of which, remove them into other lines fifteen inches apart, and four or five in line; there to remain one, or, at most, two years, in proportion to their progress, or the soil they are to be planted in. If they are intended for very barren scites, plants nursed for two seasons *only* are to be preferred. The roots of this plant should not be pruned at any time, if it can be avoided; nor indeed should any of the resinous tribes, except a small bit of the tap roots of seedling infants. The American spruce, and the silver fir, are also to be taken from the seminary at the end of the second year, and planted in lines twelve inches apart, and four in line; nursing them there for two seasons, and then removing them into other lines, eighteen inches apart, and six in line, there to remain for one or two seasons more, according to

circumstances. Longer they should not be nursed. If they are intended for bleak exposures and barren soil, they should be removed thereto at the end of the two first seasons of nursing, if possible.

In regard to the quick or white thorn, which is a most useful plant, it may remain either one or two seasons in the seminary, according to the progress it may have made; then planting in lines twelve inches apart, and two in line: at the end of one season, removing the plants into other lines, twelve inches apart, and four in line. The roots may be gently pruned.

It is observed, that "the reason of removing them at the end of the first year, is to encourage the progress of their fibry roots. At the end of the second, they will be fit for *bedging* in any situation whatever; nor will plants of any age or size outgrow them within the third year, if they are properly kept clean afterwards, as he has proved by repeated experiments made impartially on very different soils, situations, and exposures.

Season of Planting.—For the deciduous kinds, from the middle of February to about the 20th of March is considered the most eligible season; and for the evergreens, from the 20th of July to about the middle of August; taking advantage of wet or cloudy weather, and frequently watering in hot, dry weather, till the plants have struck root perfectly.

And the plants of all descriptions should be carefully kept clean of weeds in the summer months; and the interstices of all the rows, which stand over year, be pointed in with a narrow spade, in any of the winter months, being careful not to injure the roots of the plants in the operation. And in respect to pruning, the evergreens must not be touched, unless they put forth rival stems or leaders; in which case, the weakest must be displaced. The larch is to be treated in the same manner. All branches of the deciduous kinds, which seem to rival the stem in size, or take upon them the office of leaders, are to be cut clean off by the bole with a sharp knife. This is the general management, which is necessary to be noticed here. See PLANTING.

NURSERY, in *Gardening*, a portion of ground set apart for the raising and nursing various sorts of trees, shrubs, and herbaceous plants, to proper states of growth, for supplying the different gardens, orchards, plantations, and other departments.

In these situations are raised all the different sorts of fruit-trees, and fruit-bearing shrubs, by nursing and training them up to proper sizes and growths for planting, where they are to remain to produce their fruit; as well as the vast train of forest trees, hardy ornamental trees, and deciduous evergreen shrubs; training them up properly for the purposes for which they are designed in plantations and pleasure-grounds.

And various sorts of hardy herbaceous plants, both of the fibrous, bulbous, and tuberous-rooted kinds, may be here provided in proper states for being planted out.

These different sorts of plants are raised by seed, suckers, layers, cuttings, slips, offsets, parting the roots, grafting, budding, &c. as directed under their several heads.

And as some of the various sorts are drawn off annually, to supply different situations, a fresh supply of young plants should be accordingly raised every year in the nursery, of most of the various kinds, so as to have it always fully stocked with most kinds in different states of growth: some in seed-beds, others transplanted in nursery rows; some one year, others two, three, or several years; all of which should

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be well attended to, that there may be a sufficiency of plants of all sorts, for furnishing every different department of gardening, as they may be wanted.

In public nursery-grounds it is customary to have convenient green-houses, glass-cases, and stoves, with their proper appendages, for raising tender exotics from the warmer parts of the globe, which are always placed in the warmest and most sunny situations, having their fronts directly facing the south, to have all possible benefit from the sun's influence; which serve for raising and nursing the various tender plants to a proper growth, for furnishing other larger conservatories, green-houses, &c.

Size, Soil, and Situation.—In respect to the extent or dimensions of nursery-grounds, they should be according to the quantity of plants required, or the demand for sale. If for private use, from a quarter or half an acre to five or six may be proper, which should be regulated according to the extent of the garden-ground and plantations they are required to supply; and if for public or general cultivation, not less than three or four acres of land will be worth occupying, and from that to fifteen or twenty acres, or more, may be requisite, in proportion to the demand.

The soil for nursery-grounds should be of different qualities, in order that it may suit different sorts of trees and plants.

Nurserymen generally prefer a loamy soil of a moderately light nature; however, they may be formed of any good moderately light land, that has fifteen or eighteen inches deep of good working soil; but if two or three spades deep, it will be the better; and where there is scope of ground to choose from, that where there is a good depth, and a naturally rich or good soil, should be preferred, as the soil of a nursery cannot be too good, notwithstanding what has been advanced to the contrary; as where the soil is poor and lean, the plants are mostly languid, weak, and stunted, no art being able to improve them; while those raised in a good mellow soil always assume a free growth, and advance with strength and vigour. It is not requisite, however, that the soil should be very rich, nor over-manured; a medium between the two extremes is the most proper, such as mellow pasture land, having the sward turned to the bottom, which is excellent for the growth of trees: and any similar eligible soil of corn-fields is also extremely proper; any other good soil, of the nature of common garden-earth, is likewise well adapted for a nursery-ground.

As to situation, where it is rather low than high, it is better, as being naturally warmer, and more out of the power of cutting boisterous winds than a higher situation; though, where some parts of the ground are high, and others low, it may be an advantage, in better suiting the nature of the different plants. It is also of advantage to have nursery-grounds fully exposed to the sun and free air, and, if possible, where there is the convenience of having water, for the occasional watering of young seedlings, and newly removed plants.

When for private use, where there is room, nursery-grounds may either be entirely detached, or contiguous to the outer boundaries of the shrubbery plantations of the pleasure-ground; and so contrived as to lead insensibly into it by winding walks, so as to appear part of the garden or shrubbery.

Method of inclosing, preparing, and laying out.—In respect to the outside fence, it may either be a hedge and ditch, or a paling. The former is the cheapest; and most durable; though, where hares and rabbits abound, paling fences are most eligible.

Paling, or other similar close fence, is, however, in ge-

neral, for some part, extremely useful to train young wall-trees to a proper growth for garden-walls, &c.

After being thus fenced in, the ground should be all regularly trenched over one or two spades deep, according to the natural depth of the soil: after which, proceed to divide it by walks into quarters, and other parts; letting a principal walk lead directly through the middle, or some principal part, which may be from five to eight or ten feet wide, according to circumstances, having a broad border on each side. Another walk should be carried all round, next the outward boundary, four or five feet wide, leaving an eight or ten feet border next the fence all the way; dividing the internal part by smaller cross-walks, so as to form the whole into four, six, or eight principal divisions.

One or more of these divisions should be appropriated for the reception of all sorts of seeds, for raising plants to furnish the other parts; subdividing it into four-foot wide beds, with foot-wide alleys at least between bed and bed. In these beds should be sown seeds, &c. of all such trees, shrubs, and herbaceous plants, as are raised from seed; and which should contain the various sorts of kernels and stones of fruit, to raise stocks for grafting and budding upon, as well as the seeds of forest trees, ornamental trees, shrubs, &c. and of numerous herbaceous perennials, of the fibrous and bulbous-rooted tribes.

The season for sowing is both spring and autumn, according to the nature of their different sorts, as may be seen under their different heads. When the young tree and shrub seedling-plants, thus raised, are one or two years old, they should be planted out in nursery-rows, into the other principal divisions; but many kinds of herbaceous plants require to be pricked out from the seed-beds, when only from two to three or four months old; and, on the contrary, most kinds of bulbous seedlings will not be fit for planting out in less than one or two years, at the shortest periods.

Another part of these grounds should be allotted for stools of various trees and shrubs, for propagation by layers, by which vast numbers of plants of different kinds may be raised. These should be strong plants, set in rows three or four feet distance every way: such of them as naturally rise with tall stems, after being planted one year, are headed down near the ground, to force out many lower shoots conveniently situated for laying them down. See STOOLS and LAYING.

The cuttings, suckers, slips, offsets, &c. of hardy trees, shrubs, and plants, may be planted out in any convenient part of the ground, in shady borders, &c.; but for the more tender kinds, some warm sheltered situation should be provided.

The other principal divisions of these grounds should be left for the reception of various sorts of seedling plants from seminary quarters, as well as for those that are raised from suckers, layers, cuttings, &c. to be planted in rows from one to two or three feet asunder, according to their natures and growths; allowing the tree and shrub kinds treble the distance of the herbaceous perennial sorts. Of the tree and shrub kinds, some are to be planted for stocks to graft and bud the select sorts of fruit-trees, and other choice plants upon, that are usually propagated by such methods; others should be trained up entirely on their own roots, without budding and grafting, as in most forest and other hardy tree kinds, as well as almost all the sorts of shrubs.

It is also proper to have some dry warm sheltered situation in the full sun, in these grounds, for occasional hot-beds of dung or tan, for raising and forwarding many sorts of tender or curious exotics by seed, cuttings, suckers, slips, &c. which should be furnished with suitable frames and

and lights, hand-glasses, garden-mats, and other requisites for that sort of culture.

Methods and Times of Stocking with Plants.—The particular modes of cultivation are fully explained under the different heads of the plants, and the operations that are necessary in raising them to the best advantage.

As to the seasons for performing the works of sowing, planting, &c. they are different in different kinds; but the autumn and spring are the principal seasons. For planting out, or removing, the principal season is about October, and in April for tender kinds, especially the evergreen tribe; but most other hardy trees and shrubs may be transplanted any time in winter, in open mild weather. The nature of the soil should, however, be regarded in this business.

The hardy herbaceous fibrous-rooted plants may be removed almost any time, either in autumn or spring, and many sorts even in the summer; but for the older or larger plants, the autumn or very early spring are the best periods, which are the only proper seasons for dividing or slipping the roots of all these kinds for further increase.

And for the bulbous and such tuberous roots, whose leaves, like most of the bulbous tribe, decay in summer, the proper season for planting or removing them is the spring and summer months, when their flower-stalks decay, as well as to separate their offsets for increase; which may either be planted again directly, or kept out of ground one, two, or several months; though it is proper to plant the principal part again in autumn, unless where retained for sale, &c.

The succulent perennial sorts may be removed almost any time in the spring, summer, or early autumn; but the last is the best. But most kinds of succulent cuttings succeed best when planted in the summer season.

Methods of disposing the Plants.—In the distribution of the different sorts in these grounds, each should be separate: the fruit, forest trees, &c. occupying spaces by themselves, nearly together; all the shrub kind should also be ranged in separate places, allotting suitable spots for herbaceous perennials and tender plants, defended with yew or privet hedges, or a reed fence, &c. in which may be set such plants, in pots, as are a little tender whilst young, and require occasional shelter from frost, but not so tender as to require to be housed, as green-house plants, &c. And in such places, frames of various sizes may be placed, either to be covered occasionally with glass-lights, or with mats, to contain some of those more choice tender kinds in pots, to be nursed a year or two, or longer, with occasional shelter, till gradually hardened to bear the open air.

The arrangement of all the sorts in the open grounds should always be in lines or nursery rows, as already suggested, placing the fruit-tree stocks, &c. for grafting and budding upon, in rows two feet asunder, when for dwarfs; but for standards two feet and a half, and a foot and a half in the lines. But as, after being grafted and budded, they become fruit-trees, &c. where they are to stand to grow to any large size, they should be allowed the width of a yard between the rows. Forest-trees should also be placed in rows from two to three feet asunder, and half that distance in the rows; varying the distance both ways, according to the time they are to stand; the shrub should likewise be arranged in rows about two feet asunder, and fifteen or eighteen inches distant in each line; and as to the herbaceous plants, they may generally be disposed in four-feet wide beds, or large borders, in rows, or distances, from six to twelve or eighteen inches asunder, according to their nature of growth, and the time they are to stand or remain in them.

By this mode of arrangement, a great number of plants are included within a narrow compass, but which is sufficient, as they are only to remain a short time; and, besides, they are more regularly kept under proper regulation.

In public grounds of this sort many kinds of seedling-trees and shrubs are planted out often in much closer rows at first than these, not only in order to husband the ground to the best advantage, but by standing closer it encourages the stem to shoot more directly upward, and prevent their expanding themselves much any where but at top, as, for instance, many sorts of evergreens that are of slow growth the first year or two, such as the pine trees, firs, and several others, which the nursery gardeners often prick out from the seminary, first into four-feet wide beds, in rows lengthways, six inches asunder; and after having one or two years growth here, transplant them in rows a foot asunder, and in a year or two after give them another and final transplantation in the nursery, in rows two or three feet asunder, as above: these different transplantings encourage the roots to branch out into many horizontal fibres, and prepare them better for being finally planted out.

The various sorts of nursery plants, after being raised in some of the above methods, are sometimes pricked out by dibble, in other cases put in by the spade, either by trenches, flitting-in, trenching, or holing; and some are drilled in by a spade or hoe, according to the kinds.

Sometimes young seedling-trees and shrubs are pricked out from the seminary by dibble, sometimes put in by the spade in the following methods; first, having set a line to plant by, the spade is stricken into the ground with its back close to the line, and another stroke given at right angles with it; then a plant set into the crevice made at the second stroke, bringing it close up into the first-made crevice even with the line, pressing the mould close to it with the foot; then proceeding to plant another in the same way, and so on. A second method, for plants with rather larger roots, is to strike the spade down with its back close to the line, and then cut out a narrow trench with it close along the line, making the side next the line perfectly upright, placing the plants upright against the back of the trench close to the line, at the proper distances; and as the work proceeds, trimming in the earth upon their roots; when one row is thus planted, the earth should be trodden gently all along close to the plants; and then proceed to plant another row in the same manner. Another method of planting out small tree and shrub plants is, after having set the line as above, to turn the spade edgewise to the line casting out the earth of that spit, then a person ready with plants, setting one in the cavity close to the line, and directly taking another such spit, turning the earth in upon the roots of the plant, and then placing another plant into the second cut, covering its roots with the earth of a third spit, and so on to the end; but sometimes, when the roots are much larger, holes are made along the line wide enough to receive the roots freely every way, covering them in, as above, as the work proceeds, always pressing the earth gently with the foot close to the roots, and closing it about the stems, to settle the plants firmly in their proper positions.

Fibrous-rooted herbaceous plants are mostly planted with a dibble, except when the roots are large and spreading, or such as are removed with balls of earth; when they are more commonly planted by holing them in with a garden trowel, or small spade for the purpose.

But bulbous and tuberous-rooted plants, such as lilies, tulips, anemones, ranunculuses, &c. are commonly planted with a dibble, and many sorts may be planted in drills drawn with a hoe.

NURSERY.

They are also sometimes planted by raking or trimming the earth from off the top of the beds from about three to four or five inches deep, into the alleys, then placing the roots in rows upon the surface, thrusting the bottoms a little into the ground, and immediately covering them with the earth which was drawn off into the alleys, spreading it evenly over every part, so as to bury all the roots at an equal depth in the soil.

The tender kinds of exotic plants, that require occasional shelter whilst young, should many of them be potted, in order for moving to warm situations in winter, or some into frames, &c. to have occasional shelter from frost by glasses or mats, as they may require; hardening them, however, by degrees, to bear the open air fully in the nursery the year round. And the most tender kinds that require the aid of a greenhouse or stove, should all be potted, and placed in their proper situations. See GREENHOUSE and STOVE PLANTS.

General Culture of the Plants.—In the management of the various hardy nursery plants, those intended as stocks or fruit-trees should have their stems generally cleared from lateral shoots, so as to form clean straight stems, but never to shorten the leading shoot, unless it is decayed, or becomes very crooked, in which case it may be sometimes proper to cut it down low in spring, to shoot out again, training the main shoot for a stem, with its top entire, till grafted or budded. See GRAFTING, BUDDING, and TRAINING.

But in the culture of the fruit-tree kind, the sorts designed for principal wall-trees, particularly such as peaches, nectarines, apricots, &c. should, when of one year's growth from grafting and budding, be planted against some close fence, as a wall, paling, reed-hedge, &c. and their first graft or bud-shoot headed down in the spring, to promote an emission of lower lateral shoots and branches, in order to be regularly trained to the fence in a spreading manner for two or three years, or till wanted to form the head in a regular spreading growth, which, in public grounds of this kind, should always be ready in proper training, to supply those who may wish to have their walls covered at once by such ready trained trees. And a similar training, both for wall and espalier fruit-trees, may be practised with some principal sorts in the nursery-rows in the open quarters of the ground, by directing their branches, in a spreading manner, to stakes placed for the purpose.

Standard fruit-trees should only be trained with a clean single stem, five or six feet for full standards, by cutting off all laterals arising below; half-standards should be trained with three or four-foot stems, and dwarf standards in proportion, by the same means.

The heads of the standards in some may be directed by having the first immediate shoots from the graft or bud, when a year old, pruned short in spring to procure lateral shoots, in order to form a fuller spread of branches, proceeding regularly together from near the summit of the stems, and thus give a more regular branchy growth to them.

Forest-trees should, in general, be encouraged to form straight clean single stems, by occasional trimming off the largest lateral branches, which also promotes the leading top-shoots in rising straight, and faster in height, always suffering that part of each tree to shoot at full length; that is not to stop it, unless where the stem divides into forks, when the weakest should be trimmed off, and the straightest and strongest shoots or branches left to shoot out at their proper length, to form the aspiring tops.

The different sorts of shrubs should mostly be suffered to branch out in their own natural way, except merely regulating very disorderly growths; and some sorts may be

trained with single clean stems, from about one foot to two or three high, according as may be thought proper. But shrubs in general appear the most agreeable when permitted to shoot out laterally all the way, so as to be branchy or feathered to the bottoms of the stems.

The fruit-trees in each species should, as soon as grafted or budded, have all the different varieties numbered, by placing large flat-sided sticks at the ends of the rows, for which purpose the spokes of old coach-wheels, or any thing about that size, of any durable wood, answers very well, painting or marking upon them the numbers, and entering them in the nursery-book, with the name of the varieties to which the number-sticks are placed, by which, at all times, a ready recourse may be had to the sorts wanted.

And it is useful to employ the same means to trees, shrubs, and herbaceous plants, especially the varieties of particular species, when they are numerous, such as in many of the flowery tribes; as auriculas, carnations, tulips, anemones, ranunculuses, &c.

Watering nursery plants is very requisite in dry hot weather, in spring and summer; such as seed-beds and tender seedling plants, while young, and when first planted out, till they have taken good root; also occasionally to new-laid layers and newly planted cuttings in dry warm weather; but as to hardy trees and shrubs of all sorts, when planted out at the proper time, as not too late in the spring, no great regard need be paid in this respect, as they generally succeed very well without.

The next business is, in every winter or spring, to dig the ground between the rows of all sorts of transplanted plants in the open nursery quarters, a practice which is particularly necessary to all the tree and shrub kinds that stand wide enough in rows to admit the spade between them; this work is, by the nurserymen, called turning-in; the most general season for which is, any time from October or November until March, but the sooner it is done the more advantageous it will be to the plants. The ground is to be dug only one spade deep in these cases, proceeding row by row, turning the top of each spit clean to the bottom, that all weeds on the top may be buried a proper depth. It is a most necessary annual operation, both to destroy weeds, and to increase the growth of the young plants.

And in the summer season, great attention is necessary to keep all sorts clean from weeds; the seedlings growing close in the beds must be hand-weeded; but among plants of all sorts that grow in rows wide enough to admit the hoe, it will prove not only most expeditious, but, by loosening the top of the soil, promote the growth of all kinds of plants. It should always be performed in dry weather, and before the weeds grow large. See HOE and HOING.

As soon as any quarter or part of these grounds is cleared from plants, others must be introduced in their room from the seminary; the ground being previously trenched over for the purpose, giving it the addition of manure if necessary.

It is supposed by some to be of advantage to plant the ground with plants of a different kind from those which occupied it before, but this is probably not very material.

The tender or exotic plants of all kinds that require shelter only from frost whilst young, and by degrees become hardy enough to live in the open air, should, such of them as are seedlings in the open ground, have the beds arched over with hoops or rods, at the approach of winter, in order to be sheltered with mats in severe weather; and those which are in pots, either seedlings or transplanted plants, should be removed in October in their pots to warm sunny situations sheltered with hedges, &c. placing some close under the

fences facing the sun, where they may have occasional covering of mats in frosty weather; others that are more tender being placed in frames to have the occasional covering either of glass lights or mats, &c. observing that they are gradually to be hardened to the open ground, and need only to be covered in frosty weather; at all other times they should remain fully exposed, and, by degrees, as they acquire age and strength, become inured to bear the open air fully, so as when they arrive at from two or three to four or five years old, they may be turned out into the open ground.

NURSINGDY, in *Geography*, a town of Hindoostan, in Bengal; 20 miles E.N.E. of Dacca.

NURSINGPOUR, a town of Hindoostan, in Gurry Mundella; 35 miles W. of Gurrah.—Also, a town of Bengal; 8 miles E. of Doefa.—Also, a town of Bengal; 36 miles S. of Dacca.

NURTINGEN, a town of Wurtemberg, on the Neckar, where an hospital was founded in 1481, which is said to be the richest foundation in the whole duchy; 14 miles S.E. of Stuttgart. N. lat. 48° 36'. E. long. 9° 25'.

NURTURE, *Guardian for*, in *Law*. See **GUARDIAN**.

NUS, in *Geography*, a town of France, in the department of the Dora; 6 miles S.E. of Aosta.

NUSANCE, **NOCUMENTUM**, in *Law*, is used not only for a thing done to the hurt or annoyance of another, in his free lands or tenements, but also for the assise, or writ lying for the same.

The word is derived from the French, *nuire*, to hurt.

The word is mentioned anno 22 Hen. VIII. cap. 4. Nufances are either *public* or *private*: a *public* or *common* nuisance is an offence against the public in general, either by doing what tends to the annoyance of all the king's subjects, or by neglecting to do what the common good requires: in which case annoyances and injuries to streets, highways, bridges, and large rivers; as also disorderly ale-houses, bawdy-houses, gaming-houses, stages for rope-dancers, mountebanks, &c. cottages erected singly on the waste, making and selling of squibs and fire-works, or throwing them about in any street, eaves-droppers, a common-field, and keeping of hogs in any city or market-town, are held to be common nuisances. A *private* nuisance is when only one person or family is annoyed, by the doing of any thing; as where a person stops up the light of another's house, or builds in such a manner, that the rain falls from his house upon his neighbour's; as likewise the turning or diverting water from running to a man's house, mill, meadow, &c. corrupting or poisoning a water-course, by erecting a dye-house, or a lime-pit, for the use of trade, in the upper part of the stream; stopping up a way that leads from houses to lands; suffering a house to decay, to the damage of the next house; erecting a brew-house in any place not convenient; or an house of office, &c. so near another person's house as to offend him by its smell; or exercising any offensive trade, and setting up a fair or market to the prejudice of another.

Indictment lies for a *public* or *common* nuisance at the king's suit, whereon the party offending shall be fined and imprisoned; but no action can be brought in this case, except one man suffers more by a common nuisance than another; as where a pit is dug in the highway, and he falls into it. Action on the case, or assise of nuisance, lies, for any *private* nuisance, at the suit of the party aggrieved, and on such actions judgment is given that the nuisance shall be removed, and the injured party recover damages: but if a person has only a term of years in a house or lands, as he has no freehold therein, he can only have an action on the case,

by which means the nuisance will be removed without his recovering damages. The continuation of a nuisance is by the law considered as a new nuisance, and therefore, where a person suffers a nuisance to be set up, and then alienates and lets the land, &c. without removing it, an action of the case lies against him who erected it; and also against the alienee or lessee, for continuing it. It has been adjudged that any person may remove a nuisance, in which case, even the cutting down a gate that crosses the highway is legal; yet if a man destroys the nuisance himself, before he commences his action, he cannot have it afterwards, nor recover damages. Neither the lord of a manor, nor the king himself, can license any person to make or erect a nuisance. Manwood makes three kinds of nuisances in the forest; the first, *common* nuisance; the second, *special* nuisance; the third, *general* nuisance.

The writ of nuisance, *de nocumento*, is either simply *de nocumento*, or *de parvo nocumento*.

Writs of nuisance are now properly termed *trespasses*, and actions upon the case.

NUSANCE, *Abatement of*, denotes the removal of it, which the party aggrieved is allowed to do, so as he commits no riot in the doing of it. 5 Rep. 101. 9 Rep. 55.

If a house or wall is erected so near to mine, that it stops my ancient lights, which is a *private* nuisance, I may enter my neighbour's land, and peaceably pull it down. (Salk. 459.) Or if a new gate is erected across the public highway, which is a *common* nuisance, any of the king's subjects passing that way may cut it down, and destroy it. (Cro. Car. 184.) The reason why the law allows this private and summary method of doing one's self justice, is, because injuries of this kind, which obstruct or annoy such things as are of daily convenience and use, require an immediate remedy; and cannot wait for the slow progress of the ordinary forms of justice.

NUSANCE, *Assise of*, is a writ, wherein it is stated that the party injured complains of some particular fact done, *ad nocumentum liberi tenementi sui*, and therefore commanding the sheriff to summon an assise, that is, a jury, and view the premises, and have them at the next commission of assises, that justice may be done therein (F. N. B. 183.); and if the assise is found for the plaintiff, he shall have judgment of two things. 1. To have the nuisance abated, and 2. To recover damages. (9 Rep. 55.) This action, as well as that called *quod permittat profermere*, are now out of use, and have given way to the action on the case; in which no judgment can be had to abate the nuisance, but only to recover damages.

NUSBERG, in *Geography*, a town of Prussia, in Ermland; 10 miles S.S.W. of Heilsberg.

NUSCO, a town of Naples, in Principato Ultra, the see of a bishop, suffragan of Salerno; 8 miles N. of Conza. N. lat. 40° 56'. E. long. 15° 1'.

NUSHAR, a town of Asiatic Turkey, in the government of Marasch, at which there is a passage over the Euphrates; 55 miles S.W. of Diarbekir.—Also, a town of Curdistan, at the foot of mount Ararat; 20 miles N.E. of Van.

NUSSERABAD, a town of Hindoostan, in Candesh; 30 miles S.W. of Burhanpour.

NUSSERATPOUR, a town of Hindoostan, in Baglana; 20 miles N.E. of Chandor.

NUSSERPOUR, a district or province of Hindoostan, in Sindy, lying on each side of the Indus, between Sewestan and Tatta.—Also, a town of Hindoostan, and capital of a country of the same name, on the Sinde; 30 miles S.W. of Moultan. N. lat. 25° 20'. E. long. 68° 20'.

NUSTAM, a word used by Paracelsus and his followers to

to exprefs the cream of milk, or the pellicle which in fome cafes fwims upon the furface of wine.

NUT, in *Botany* and *Vegetable Phyfiology*, *Nux*, a hard and bony feed, not opening by valves, usually confifting of but one cell, fometimes of more, each cell containing one, rarely two, kernels. See **SEED**.

NUT, *Barbadoes*. See **PERIHONES**.

NUT, *Bladder*. See **STAPHYLÆA**.

NUT, *Cafheer*. See **ANACARDIUM**.

NUT, *Cob*. See **HAZEL** and **CORYLUS**.

NUT, *Cocoa*, the name of a genus of plants, called by botanifts *cacao*. See **THEOBROMA**. See alfo **COCOS**.

NUT, *Earth*. See **ARACHIS**.

NUT, *Faufel*. See **ARECA**.

NUT, *Filbert*. See **FILBERT** and **CORYLUS**.

NUT, *Hazel*. See **HAZEL** and **CORYLUS**.

NUT, *Malabar*. See **JUSTICIA**.

NUT, *Peas*, which fome call the *lathyrus* of botanical writers. See **LATHYRUS**.

NUT, *Phyfic*, a name fometimes given to the *ricinoides* of Tournefort. See **JATROPHA** and **TURNSOLE**.

This is alfo a name fometimes given to the caftada, and fometimes to the croton. See **PINEI Nuclei**, &c.

NUT, *Pig*, a name by which the bulbocallanum, or earth-nut is fometimes called. See **BUNIUM**.

NUT, *Piftachia*. See **PISTACHIA**.

NUT, *Spanifh*, a name by which fome call the fifyrinchium of botanical writers, or the iris with a double bulb of Linnaeus.

NUT, *Vomic*. See **NUX Vomica**.

NUT, *Wall*, the name of a well-known genus of trees, called by Linnaeus *juglans*, and by Tournefort fimpfy *nux*. See **JUGLANS** and **WALNUT**.

NUT-Cracker, *Nut-hatch*, or *Nut-jobber*, in *Ornithology*. See **SITTA Europea**.

NUT-Cracker. See **CORVUS Caryocatactes**.

NUT-Hatch, the Englifh name of a bird known among authors by that of *sitta*; and from its climbing trees in the manner of the wood-pecker, called by fome, though improperly, *picus cinereus*, the grey wood-pecker. (See **SITTA Europea**.) This is alfo the name of other fpecies of *Sitta*; which fee.

NUT-Jobber. See **SITTA Europea**.

NUT-Oil, is the oil of walnuts, preffed out of the kernels by means of a fcrew-refs. This is ufed for the mixing with flake white or other pigments, where the clearnefs of the colour is of great confequence, and would be injured by the brown hue of linfeed oil.

NUTS of an Anchor, in a *Ship*, are two little prominences, appearing like fhort fquare bars of iron, fixed acrofs the upper part of the anchor-flank, to fecure the flock of it in its place; for which purpofe there is a correfponding notch, or channel, cut in the oppofite parts of the flock, of the fame dimenfions with the nuts.

NUTATION, in *Aftonomy*, a kind of trepidation, or tremulous motion of the axis of the earth; whereby its inclination to the plane of the ecliptic is not always the fame; but varies backwards and forwards fome feconds: and the period of thefe variations is nine years. This nutation was difcovered by Dr. Bradley, who publifhed an account of his difcovery in the year 1737. He alfo difcovered the caufe of this phenomenon in the Newtonian fyftem of attraction.

The firft principle of that fyftem is known to be, that all bodies mutually attraft each other in the direct ratio of their maffes, and in the inverfe ratio of the fquares of their diftances. From this mutual attraction, combined

with motion in a right line, Newton deduces the figure of the orbits of the planets, and particularly that of the earth. If this orbit was a circle, and if the terreftrial globe was a perfect fphere, the attraction of the fun would have no other effect than to keep it in its orbit, and would caufe no irregularity in the pofition of its axis; but neither is the earth's orbit a circle, nor its body a fphere; for the earth is fenfibly protuberant towards the equator, and its orbit is an ellipfis, which has the fun in its focus. When the pofition of the earth is fuch, that the plane of its equator paffes through the centre of the fun, the attractive power of the fun acts only fo as to draw the earth towards it, ftill parallel to itfelf, and without changing the pofition of its axis, and this happens at the equinoxes. In proportion as the earth recedes from thofe points, the fun alfo goes out of the plane of the equator, and approaches that of one or other of the tropics; the femidiameter of the earth, which is then expofed to the fun, being no longer equal, the equator is more powerfully attracted than the reft of the globe, which caufes fome alteration in its pofition, and its inclination upon the plane of the ecliptic: and as that part of the orbit, which is comprifed between the autumnal and vernal equinox, is lefs than that which is comprifed between the vernal and autumnal, it follows, that the irregularity caufed by the fun, during his paffage through the northern figns, is not entirely compensated by that which he caufes during his paffage through the fouthern figns; and that the parallelifm of the terreftrial axis, and its inclination with the ecliptic, will be a little changed. But though the irregularity is now accounted for, we are ftill at a lofs for the caufe of its happening in a period of nine years. This difficulty, however, will immediately difappear.

The fame effect which the fun produces upon the earth, by its attraction, is alfo produced by the moon, which acts with greater force, in proportion as it is more diftant from the equator; now, at the time when its nodes concur with the equinoctial points, its greateft latitude is added to the greateft obliquity of the ecliptic. At this time, therefore, the power which caufes the irregularity in the pofition of the terreftrial axis, acts with the greateft force; and the revolution of the nodes of the moon, being performed in eighteen years, it is clear, that in eighteen years the nodes will twice concur with the equinoctial points; and, confequently, that twice in that period, or once every nine years, the earth's axis will be more influenced than at any other time; fo that it will have a kind of balancing backward and forward, the period of which will be nine years, as Mr. Bradley had obferved; and this balancing he calls *the nutation of the terreftrial axis*. See Phil. Tranf. N^o 406 and N^o 485, in vol. xlv. p. i. &c. and a fuller account of Dr. Bradley's obfervations under the article **STARS**.

That the moon has the like motion, is fhewn by fir Ifaac Newton, in the firft book of his Principia; but he obferves, that this motion muft be very fmall, and fcarcely fenfible.

NUTMEG, *Nux Mofchata*, a delicate kind of aromatic fruit, or fpice, the fruit of the *Myriflica*; brought from the Eaft Indies, and particularly the Molucca iflands; of which there are diftinguifhed two kinds, the *male* and *female*.

The female is that chiefly ufed among us; its form is round or oval, of the drupous kind, and its tafte hot and pungent.

The male is a wild nut, of a longifh form, and without either tafte or fmell; yet fometimes put off, while yet in the fruit, for the female. See **MYRISTICA**.

The nutmeg is inclofed in a covering, which is flefhy and tough;

tough; and which by opening at the tip separates into two valves, and discovers the "mace," (see MACE,) which has a reticulated appearance, and divides into three portions, which closely invest a slender shell, containing the seed or nutmeg. This is marked on the outside with many vermicular furrows, within of a fleshy farinaceous substance; variegated with whitish and bay, and having a cavity at the bottom for the embryo. The nutmeg tree yields three crops annually; the first in April, which is the best; the second in August, and the third in December; yet the fruit requires nine months to ripen it. When it is gathered, the outer coriaceous covering is first stripped off, and then the inner carefully separated and dried in the sun. The nutmegs in the shell are exposed to heat and smoke for three months, then broken, and the kernels thrown into a strong mixture of lime and water, which is supposed to be necessary for their preservation, after which they are cleaned and packed up; and with the same intention the mace is sprinkled with salt water. There are several varieties of the tree; but that denominated the Queen nutmeg, which bears a small round nut, is the best. They are imported in chests, which contain each from 100 to 140lbs. weight; the mace comes also in chests of different sizes; the essential oil, which is obtained in Banda by distillation of the nuts, is brought in bottles, and the expressed oil in stone jars. Nutmegs are well known, as they have been long used both for culinary and medical purposes. By distillation, or expression, they yield an oil of great fragrantcy, and use in medicine.

When distilled with water, they yield nearly one thirty-second their weight of a limpid essential oil, very grateful, possessing the flavour of the spice in perfection, and which is said to have some degree of an antispasmodic or hypnotic power: on the surface of the remaining decoction is found floating an unctuous concrete matter, like tallow, of a white colour, nearly insipid, not easily corruptible, and hence recommended as a basis for odoriferous balsams: the decoction, freed from this sebaceous matter, and inspissated, leaves a weakly bitter, subastringent extract.

The largest and heaviest nutmegs are to be chosen; such as are of the shape of an olive, well marbled withoutside, reddish within, unctuous in substance, and of a fragrant smell.

Alcohol and ether extract the whole virtue of nutmegs by infusion; and elevate very little of it in distillation; hence the spirituous extract possesses the flavour of the spice in an eminent degree. When the ethereal tincture, which is limpid and of a golden yellow colour, is evaporated in water, an equal portion of volatile essential oil unites with the water, and a white, opaque, granular, sebaceous substance, heavier than water, which has much the appearance of the expressed oil, is deposited. When alcohol is digested in this substance, it dissolves very little of it, but becomes yellow, and acquires the qualities of a spirituous solution of the essential oil. The undissolved substance, if washed in water, is nearly insipid, melts at a temperature of 150°, and on collecting, concretes into a translucent brittle cake, which has the properties of wax. The part of the nutmeg insoluble in ether is chiefly gum and starch. In distillation with water, nutmegs yield $\frac{1}{32}$ of their weight of essential volatile oil, and by expression one-third of a sebaceous fixed oil. Hence, the components of the nutmeg seem to be starch, gum, volatile oil, wax, and a fixed fat oil. The volatile oil possesses the colour and taste of the nutmeg in a concentrated degree, is of a pale straw colour, limpid, transparent, and lighter than water. The expressed oil, which is erroneously called oil of mace, when first drawn, is limpid and yellow, but on cooling acquires the consistence of sper-

maceti, and somewhat of the appearance of Castile soap, being whitish, mottled with reddish-brown. Its odour is agreeable, and slightly aromatic, and its taste fatty, pungent, and bitterish. It appears to be a vegetable cerate, or a triple compound of fixed oil, volatile oil, and wax.

Mace resembles the nutmeg in its odour and taste, but has a greater degree of pungency and bitterness. It is in lacinated, flexible, thin pieces, unctuous to the feel, and of a deep reddish-yellow colour. Alcohol and ether extract its active principles; and when the ethereal tincture is evaporated in water, a thick deep yellow-coloured, very pungent, and odorous oil is left in drops on the surface of the water, with some resin; and a small portion of extractive is also deposited, but no waxy granular matter.

Nutmegs, when heated, yield to the press a considerable quantity of limpid yellow oil, which on cooling concretes into a sebaceous consistence. In the shops we meet with three sorts of unctuous substances, called "oil of mace," though really expressed from the nutmeg. Besides the two sorts, mentioned under the article *Oil of MACE*, there is a third, which is the worst of all, and usually called "common oil of mace." This is an artificial composition of sebum, palm oil, and the like, flavoured with a little genuine oil of nutmeg. The medicinal qualities of nutmeg are supposed to be aromatic, anodyne, stomachic, and restringent, and with a view to the last mentioned effects, it has been much used in diarrhoeas and dysenteries. To many people the aromatic flavour of nutmeg is very agreeable; they should, however, be cautioned not to use it in large quantities, as it is apt to affect the head, and even to manifest an hypnotic power, in such a degree as to prove extremely dangerous. Bontius speaks of this as a frequent occurrence in India; and Dr. Cullen (*Mat. Med.* vol. ii.) relates a remarkable instance of this soporific effect of the nutmeg, which fell under his own observation; and hence he concludes, that in apoplectic and paralytic cases, this spice may be very improper. The officinal preparations of nutmeg are a spirit and essential oil, and the nutmeg in substance roasted, to render it more astringent. Both the spice itself and its essential oil, enter several compositions of the different pharmacopœias of the colleges of London, Edinburgh, and Dublin; those of the nutmeg are "*Spiritus myrsiticæ*," L. E. D. "*Spiritus lavendula compositus*," L. E. D. "*Spiritus raphani compositus*," D. "*Confectio aromatica*," L. D. "*Electuarium catechu*," E. D. "*Pulvis carbonatis calcis compositus*," D. "*Trochisci carbonatis calcis*," E. D. Those of the oil are "*Spiritus ammoniæ aromaticus*," D. "*Pilulæ scillæ*," D. "*Emplastrum picis compositum*," L. The dose of the nutmeg and of the mace, is from grs. v. to ʒ j; that of the volatile oil m ij to m vj. Mace possesses qualities similar to those of the nutmegs, but is less astringent, and its oil is supposed to be more volatile and acrid. Lewis. Woodville. Thomson.

NUTRITION, in *Physiology*, a function common to all organised bodies, in which their various component tissues convert nutritive matter into their own substance, and add it to the particles which previously entered into their composition.

The materials of nutrition are prepared by several previous processes; by *digestion*, in which the food is altered in its qualities, and reduced to a homogeneous mass; by *absorption*, in which the nutritive part of the aliment is extracted and conveyed into the blood; by *circulation* and *respiration*, in which this nutritive matter is converted into blood. (See those articles.) Nutrition is the completion of the functions of assimilation; the aliment, animalised by the series of processes just enumerated, and rendered similar

NUTRITION.

similar to the substance of the being which it is to nourish, is applied to the organs, whose waste it is to repair; and this identification of the nutritive matter to our organs, which take it up, and appropriate it to themselves, constitutes nutrition, in which there is a real conversion of the aliment into our own substance.

The component particles of an animal body are in a state of constant change; the old ones are detached and removed by the absorbents, and their place is supplied by new matter laid down by the arteries. Until the body has attained its full size, the movement of composition predominates over that of decomposition, and all the parts increase; when the growth is completed, and there is no apparent change of bulk, the removed and the added portions balance each other; and, as the body declines, the absorption exceeds the addition of new matter. But, at all times, there is an interior motion of the component parts. Hence the body has been compared by a French physiologist to the vessel of the Argonauts, so often repaired in the course of a long and perilous navigation, that on her return, no part of her former materials remained. An animal body probably contains none of the same molecules at two distant periods. The experiments performed by mixing madder with the food of animals, prove most unquestionably this incessant decomposition of animated and living matter. This mixture, in consequence of a chemical affinity between the madder and phosphat of lime, dyes all the bones of a red colour; when the madder is left off for a sufficient length of time, the colour disappears. (See BONE.) It is obvious, that the calcareous phosphat in the osseous system previous to the commencement of the experiment, must be gradually removed, and its place supplied by the coloured earth; while this is again absorbed in its turn, after the madder is discontinued, to make room for a new uncoloured deposition. If the hardest and most solid parts, apparently the most calculated to resist decay, are undergoing a perpetual motion of decomposition and regeneration; there can be little doubt that this motion must be far more rapid in those, whose power of cohesion is much inferior; for example, in the fluids. In the nails, hair, and cuticle, a constant growth is so regularly observed, that it is not necessary to particularise the phenomena. The fact is not so apparent in the soft parts, although we cannot doubt of its existence. The arteries and absorbents, which they all possess, can only be subservient to these uses; and we frequently see considerable enlargement or diminution of the body or a part, when either the addition or absorption acquires an undue preponderance.

Attempts have been made to determine the period, at which the body is completely renovated; it has been supposed, that an interval of seven years is necessary for one set of molecules to disappear and be replaced by others; but this is a point hardly susceptible of any precise determination. The change goes on more rapidly in childhood and in youth; it is slower in mature age; and must require a considerable time at a very advanced period of life, when all the organs become firmer, and the vital powers more languid. There can be no doubt that sex, habit, climate, mode of life, and various other circumstances, accelerate or retard it.

These considerations render it obvious, that the notion of personal identity cannot consist in sameness of the body; an animal does not consist of the *same* parts in the same arrangement, not only at no two distant periods, but not in two following days or even hours.

The absorbing vessels are the agents of the decomposition of our organs; they detach the old matter, and convey it into the blood, whence it is separated chiefly by the kidneys, and perhaps also by the other secretory organs.

The waste of the constituent particles of animal bodies is repaired by means of homogeneous particles exactly like themselves; thus each organ is the same to all appearance, although its component parts have been entirely changed. Were it otherwise, the nature of our organs would be undergoing perpetual changes.

This function of reparation is allotted to the circulating system, which is a common receptacle for the nutritive fluid extracted from our aliments, and for the materials taken away from all parts of the body by the absorbing vessels. The different substances brought into the circulating system are there converted into a homogeneous fluid, of which the composition and properties are essentially the same under all circumstances. Whether we feed on animal or vegetable matters, on one or on twenty articles, whether the body is increasing or declining, no differences, or at least none of any consequence, are observed in this fluid; our organs and means of research are not at present able to detect the variations of composition, which may be reasonably supposed to arise from the circumstances just enumerated.

From this common nutritive fluid, the blood, conveyed in tubes, which anatomy shews us to be every where alike, each organ draws the materials requisite for its growth and support: bone, muscle, cartilage, tendon, brain, nerve, &c. convert some part of the blood, respectively, into those different tissues. The process seems very similar to that of secretion: in the latter, various matters are formed, to answer particular purposes in the economy, and are then expelled from the body; in the former, the new products drawn from the blood are added to the body, and become identified with its structure. Nutrition must be different in the different tissues; each appropriating to itself whatever it meets with, fitted to its nature, in the fluids conveyed to it, and leaving untouched the remaining heterogeneous particles. Probably there is not much difference in the basis of all our organs: cellular tissue, arteries, veins, nerves, exhalants, and absorbents, are the common and uniform ground-work. These six organic systems are not found in all the organs, some of which have no arteries nor veins, some no nerves, &c.: but they meet together in most; and there are always some present, although others may be wanting. The exhalants and absorbents are the most universally found: nutrition, resulting from a double motion, of composition, which brings nutritive matter to the organs, and of decomposition, which removes it, supposes their existence; the exhalants are the agents in the first of these motions, the absorbents in the second. The general systems above-mentioned constitute the nutritive parenchyma of every organ, the mould into which the nutritive substance is deposited. The latter, different in every instance, constitutes the difference of the various organs. It is phosphat of lime and gelatine in the bones, gelatine only in the cartilages and tendons, fibrine in the muscles, &c. See the article FIBRE.

The nutrition of a part requires a supply of arterial blood, the source of its materials. Tying the principal artery of a limb does not interrupt this function, because the blood is conveyed through other channels; but a general ligature, impeding the entrance of blood altogether, is followed by death of the part. The influence of the brain and nerves is

not

not essential to this function. Paralyzed limbs retain their size at first; but after the lapse of time, they become smaller. See *NERVOUS System*.

Like all vital processes, nutrition is subject to considerable varieties. Besides the modifications, which it exhibits from the progress of age, it may be generally increased or diminished without any affection of health. In these changes, the effect is produced only on particular tissues: the bones remain of the same size, the viscera are not altered, and probably the muscles are nearly the same; the cellular tissue and its contained fat are the parts affected. Exercise has the effect of increasing the size of the muscles.

Numerous deviations from the natural course occur in this process under disease. There may be an excessive deposition of healthy matter in any organ, occasioning swelling or exostosis of the bones, tumours of various parts, &c.; or a morbid matter may be deposited instead of the natural substance of a part, as in scirrhus, soft cancer of the testis, &c. The laws, which regulate nutrition in the different organs and tissues, will be considered under the respective articles on those subjects.

In some parts of the body this process does not take place. The hair and nails grow by additions made at one end; and the part, when once formed, undergoes none of the decomposition and regeneration which have been described in this article. (See *INTEGUMENTS*.) The teeth are similarly circumstanced. (See *CRANIUM*.) We believe that nutrition goes on in all the other tissues.

The amount of what we know about nutrition is simply, that the various organic structures of the body form out of the blood, by virtue of their vital properties, muscle, bone, ligament, brain, nerve, &c. besides the different products of disease: the newly formed matters bear no resemblance to the blood, and are as widely different from each other. To the very natural question, how are these changes wrought? we can only answer by an avowal of entire ignorance. It has been asserted by some modern chemists, that the processes are chemical; and such they must undoubtedly be held, if all the alterations in the component elements of matter fall under the department of chemistry. We cannot, however, compare the results of nutrition to any of the phenomena ordinarily called chemical. No chemist has ever succeeded in converting food into chyle, chyle into blood, and the latter into twenty or thirty different matters. Chemistry has as yet advanced but little in determining the difference of composition between blood and the substance of our organs: still less has it pointed out how each part robs this fluid of its elements, to convert them into its own nature. If we examine vegetable and animal substances by destructive analysis, we gain very different elements, and are puzzled to understand how food of the former kind can furnish materials for the latter: vegetables may be resolved into carbon, hydrogen, and oxygen, with sometimes a small proportion of azote, some salts, and other materials. In an animal body, azote predominates. The chemical physiologists have endeavoured to explain how this conversion is effected. But we take the liberty to suggest that that is not the true problem of nutrition: our inquiry is, how blood is changed into bone, brain, muscle, &c.; and in prosecuting this investigation, destructive analysis may embarrass the question, but can hardly afford much assistance.

Perhaps we are yet hardly acquainted with the extent of the nutritive power. If an animal were supplied with food, from which lime and phosphoric acid were carefully excluded, would the formation of bone go on? In other words, can the exhalant arteries form phosphat of lime

from the blood, if it contains none? Some facts have been ascertained, which bear analogically on this point; but there is no direct proof either for or against it. Dr. Fordyce found, that if the canary bird was not supplied with lime, at the time of her laying, she frequently died from her eggs not coming forward properly. He divided a number of these birds, at the time of their laying eggs, into two parties: to the one he gave a piece of old mortar, which the little animals swallowed greedily; they laid their eggs as usual, and all of them lived; whereas many of the other party, which were supplied with no lime, died. Vauquelin, on the contrary, observed, that the oats consumed in a given time by a hen contained 136.509 grains of phosphat of lime, and 219.548 grains of silica. The shells of the eggs, which she laid during this time, contained 98.776 grains of phosphat, and 453.417 of carbonat of lime. The excrements voided in the same time contained 175.529 grains of phosphat, 58.494 grains of carbonat of lime, and 185.266 grains of silica. Consequently there were thrown out

274.305 grains of phosphat of lime.
511.911 carbonat.
185.266 silica.

	971.482
Taken in	356.057
Surplus	615.425

We refer the reader to the article *GLAND*, for our observations on secretion; to which the process of nutrition bears very great analogy.

NUTRITION of Plants. See *VEGETATION*, *SAP*, *CIRCULATION*, *PLANTS*, &c.

NUTRITION, in *Pharmacy*, an obsolete term which was used to denote a kind of preparation, consisting in the gradual mixture of liquors of different natures, by stirring them together till they have acquired a thick consistence, as in making butter of Saturn, or unguentum nutritum.

NUTRITIOUS Parts of Plants, in *Agriculture*, such parts as afford the nourishment and support of animals. In this respect there is considerable diversity of different sorts of plants, as well as in the different parts of which they are constituted. Dr. Darwin has suggested that those vegetables, which approach nearest to the nature of animal bodies, are the most likely to supply the greatest proportion of the nourishing material. Hence the esculent mushrooms, the gluten of wheat or other substances, and the oils of seeds and kernels, may be placed in the first rank in this intention. And that as the chyle of all such animals as have red blood, is supposed to be nearly similar, and to consist chiefly of sugar, mucilage, and oil; it may be concluded that those vegetables which contain the largest proportion of such materials, or of such as are capable of being converted into them by the process of digestion, may occupy the next place in respect to their nutritive properties, for such animals; provided that no noxious substances be combined with such useful properties, so that they cannot be easily separated from them. But though this be the case with these substances, there are others that may nearly supply an equal proportion of nutriment, from their great facility of being changed into sugar or mucilage, as those which abound in farina, consisting of meal or starch, which is partly converted into sugar, and partly into mucilage, in the process of melting, as well as many others. And the sap wood or albumen of most trees, it is likewise suggested, affords much nutritious matter in the winter months. This curious subject

subject may be seen more fully handled in the *Phytologia* of the above author, where a number of interesting circumstances are brought to view on the subject.

NUTRITUM, in *Pharmacy*, is a denomination given to a deficcative, cooling unguent, prepared by the agitation and nutrition of litharge of gold with oil and vinegar, or the juice of solanum, in a mortar.

NUTSHED, in *Agriculture*, a provincial term, applied to young animals, to signify their being stunted or starved in bringing up.

NUTTER MOHR, or *Utter*, in *Geography*, a town of East Friesland; 9 miles S.E. of Emden.

NUTUREE, a town of Hindoostan, in Myfore; 28 miles N.N.E. of Chitteldroog.

NUTWABARA, a town of Bengal; 23 miles N.E. of Ramgur.

NUX, in *Botany*, is not only the Latin name of a particular sort of feed, (see **NUT**.) but is applied by Tournefort generically, to designate the Walnut. See **JUGLANS**.

NUX Americana. See **MELICocca**, **QUASSIA**, and **SAPINDUS**.

NUX Avellana. See **CORYLUS**.

NUX Galla. See **GALL**.

NUX Juglans. See **JUGLANS**.

NUX Malabarica. See **STERCULIA**.

NUX Maris, in *Natural History*, a name given by many writers to a peculiar species of sea-shell. It is one of the dolium, or concha globosa kind, and a species of that genus called gondola.

NUX Mollucana, in *Botany*. See **JATROPHA**.

NUX Mosebota and *Myristica*. See **MYRISTICA**.

NUX Regia, the *royal nut*, a name given by some authors to the walnut.

NUX Vescaria. See **HERNANDIA** and **STAPHYLÆA**.

NUX Vomica, the fruit, or rather the seed of the fruit or berry of a large tree growing in several parts of Egypt, and in the islands of Timor and Ceylon; of a strong narcotic quality, so as to be ranked in the number of poisons. This is the tree, called by Plukenet *cucurbitifera Malabariensis, anopliæ foliis rotundis, fructu orbiculari rubro cujus grana sunt nuxes vomice officinarum*; described and figured in the Hortus Malabaricus under the name of *Caniram*. See **STRYCHNOS**.

It is round and flat, about an inch broad, and near a quarter of an inch thick, with a prominence in the middle on both sides, of a grey colour, covered with a kind of woolly matter, but internally hard and tough like horn. The largest, whitest, newest, and cleanest are the best.

The kernel discovers to the taste a considerable bitterness, but makes little or no impression on the organs of smell. It consists chiefly of a gummy matter, which is moderately bitter: the resinous part is very inconsiderable in quantity, but intensely bitter; hence rectified spirit has been considered its best menstruum.

This drug is said to be an assured poison for all animals except men. Instances are not wanting of its deleterious effects upon the human species. To dogs it proves fatal in a very short time; and it has also poisoned hares, foxes, wolves, cats, rabbits, and even some birds: as crows and ducks; and Loureiro relates that a horse died in four hours after taking a drachm of the seed in a half-roasted state. Its effects, however, on different animals, and even on those of the same species, are somewhat uncertain; and not always in proportion to the quantity given. With some animals it produces its effects almost instantaneously; with others, not till after several hours, when laborious respiration, followed by torpor, tremblings, coma, and con-

vulsions, usually precede the fatal spasms, or tetanus, with which this drug commonly extinguishes life. The mortal symptoms in human subjects are similar to those now mentioned in brutes; and from these, as well as the dissection of dogs killed by this poison, and manifesting no injury done to the stomach or intestines, it has been inferred that the nux vomica acts immediately upon the nervous system, and destroys life by the virulence of its narcotic influence. The quantity of seed necessary to produce this effect upon a strong dog need not be more than a scruple; a rabbit was killed by five, and a cat by four grains; and of four persons, who perished by this drug, one was a girl of ten years of age, to whom fifteen grains were exhibited at twice for the cure of an ague. Lofs, however, says, that he took one or two grains of it in substance, without discovering any bad effect; and that a friend of his swallowed a whole feed without injury. Hermannus, botanic professor at Leyden, who has written expressly on it, says, that the vomic nuts of Timor and Ceylon are, for the human species, excellent sudorifics, and are also to be ranked among diuretic medicines.

It has been recommended in tertian and quartan fevers, in virulent gonorrhœas, as well as an alexipharmic. Fallopius relates, that it was given with success in the plague; that in doses of from a scruple to half a drachm, it procured a plentiful sweat; in which case the patient recovered. From the time of Gesner till a period of late date, it has been recommended by a succession of authors, as an antidote to the plague, as a febrifuge, as a vermifuge, and as a remedy in mania, hypochondriasis, hysteria, rheumatism, gout, and canine madness. With us it is now considered, and not without good reason, as a deleterious drug, and is rarely if ever employed as a medicine. In Sweden it has been of late years successfully used in dysentery, but Bergius, who tried its effects in this disease, says, that though it suppressed the flux for twelve hours, it afterwards returned again. In one case, a woman, who took a scruple night and morning for two successive days, is said to have been seized with convulsions and vertigo, notwithstanding which the dysenteric symptoms returned, and the disorder was cured by other medicines; but it was followed by a pain in the stomach, the effect of the medicine, which continued for a long time. Bergius is therefore of opinion, that it should only be administered in the character of a tonic and anodyne in small doses from five to ten grains, and not till after proper laxatives have been employed. Loureiro recommended it as a valuable internal medicine in fluor albus, for which purpose he roasts it till it becomes perfectly black and friable, which renders its medicinal use safe without impairing its efficacy.

The lignum colubrinum and Ignatius's bean, partake of the same qualities with the nux vomica. Lewis.

NUX Zeylanica, in *Botany*. See **STERCULIA**.

NUXIA. See **MANABEA**.

NUYS, or **NUESZ**, in *Geography*, a town of France, in the department of the Roer, situated on the Erft, near its conflux with the Rhine. This town carries on a brisk trade in deal boards and coal; 22 miles N.N.W. of Cologne. N. lat. 51° 10'. E. long. 6° 35'. See **NEUSS**.

NUZZI, MARIO, in *Biography*, commonly known by the name of Mario de Fiori, a flower-painter, was born in 1603, at Penna, in the kingdom of Naples. He was educated under his uncle Tomaso Lalini, and being an exact observer of nature, he employed himself in copying the finest flowers cultivated by his father on a terrace on the roof of his house. So happy were his imitations, that a dealer who purchased his first pictures made an extraordinary profit in

in selling them again. Mario, informed of this circumstance, and also learning that his performances sold still higher at Rome, resolved to visit that capital. Here he quickly rose to a high degree of reputation, and applied himself most diligently to attain perfection in his branch of the art. His representations of nature were equally exact and elegant; he chose his subjects with taste, handled his pencil with wonderful lightness, and coloured with singular beauty. According to Mr. Fuseli, "the charm which Mario spread over his flowers was not a permanent one: the impurity of the vehicle soon absorbed the freshness and the bloom of his glazings, and left a squalid surface." Hence his pictures did not long maintain the extraordinary prices at which they were purchased. He was elected a member of St. Luke, and received from his brethren all the respect that great excellence, though in an inferior department of the art, could command. He died in 1673, at the age of seventy. He was a most diligent artist, and always worked at his profession early in the morning, saying, that "he who did not see the sun rise, lost half the day."

NY, in *Geography*, a town of Sweden, in the province of Warmeland; 36 miles N.W. of Carlstadt. — Also, a town of Sweden, in the same province; 53 miles N. of Carlstadt.

NYAKER, a town of Sweden, in Angermanland; 85 miles N.N.E. of Hernofand.

NYAMEE, a town of Africa, in the kingdom of Bambarra; 48 miles N.E. of Segó.

NYAMOV, a town of Africa, in the kingdom of Bambarra; 140 miles W. of Segó.

NYARA, a town of Africa, in the kingdom of Bambarra; 40 miles N.E. of Segó.

NYARPET, a town of Hindoostan, in the Carnatic; 35 miles N.E. of Bomrauzepollam.

NYAYA, in *Philosophy*, is the name of one of the schools of the Hindoos. The doctrines upheld by this sect are divided into two parts: the first, Nyaya, or Nyayai, corresponds more than any other with the Peripatetic, and is ascribed to Gautama, the Aristotle of Hindoo philosophy. The second, Nyayai, is sometimes called Vaishika, and is somewhat analogous to the Ionic theory: its author, Kanada, thus corresponds with Thales. It is not easy to mark the distinctions between the doctrines of the two sects of Nyayaikas, as the followers of them, more especially of the first sect, are called. The theory of Kanada is, indeed, little else than a modification of that of Gautama; the latter being the most ancient. The death of its author is placed about 550 years B.C. As well as philosophy, the Nyaya doctrines embrace an extensive system of logics and metaphysics. The leading parts are the following: There are two eternal substances, *spirit* and *matter*; the one distinguished by life and intellect, the other is inert and lifeless, moving only as it is impelled by spirit. It is not, however, said that the world in its present form has existed from eternity, but only the primary or chaotic matter, whence it springs when commanded by the creative power. Matter, in its primary state, is an invisible figureless substance. In the Sanscrit language, matter in this state is expressed by the word *beej*, or *bija*, which signifies *seed*; from this seed, or germ, the world is called forth by the Almighty fiat, and at its periodical dissolution all things return to the seminal state, in which they remain until again spread out by creative energy. Some explanation of this, or at least the manner in which it is expressed by Hindoo metaphysicians, may be found under the article KALPA. In the Gita, Krishna is made to say, "I am the eternal seed of all nature. The whole world was spread abroad by me in my invisible form; at the end of the period kalpa, all things

return into my primordial source, and at the beginning of another kalpa I create them all again." (See KRISHNA.) In the process of creation the first form of material substance is called, by the Nyayaikas, *anù*; in this invisible atomical condition, matter is eternal. Two *anùs*, or atoms, make a *dwenùk*, three a *trinùk*, and so forth; arriving at the bulk of the latter, matter assumes figure and becomes visible, and in this state it is perishable. Hence in the Nyayai system, the elements, water, earth, fire, &c. are divided into what is temporary, and what is eternal: the visible state of water, for example, is temporary; its primary state, or essence, is eternal.

The combinations or aggregations which compose the material universe, are produced by the energy of an almighty and intelligent cause, the Supreme Being. "Matter is incapable of action; whence it is evident that the motions of material objects are caused by a being different from those objects;" and hence is deduced the existence of God. The following passage is translated from a respected Sanscrit author, on the opinion of the Nyayaikas: "Though individuals have in themselves the consciousness that I am, I feel pleasure, &c. yet we have no evident knowledge that spirit and matter are different: this is proved by the following argument: an instrument requires an operator; thus, without an operator no effect can result from cutting instruments, as an axe, &c.; in like manner, without an operator, no effect would result from the eyes, &c. which are the instruments of vision, &c.; hence we infer the existence of an operative being."

The Nyayaiks conceive that spirit is a figured substance, which means that it possesses magnitude, but this magnitude is indivisible. According to Hindoo metaphysics, whatever is the subject of active and moral qualities, must have magnitude, for these qualities imply action and change; but what is absolutely without magnitude and figure, must be impossible and unchangeable; hence, as the Nyayaiks maintain that the Supreme Being is the immediate and active agent in the creation of the world, and that perception, desire, and action, are in him permanent qualities, they ascribe to him an invisible magnitude. This magnitude is so small that it moves in the smallest nerves, though they be only the thousandth part of the diameter of a hair; and this notion is supported by, or grounded on, a passage in the Veda: "Spirit is more minute than the minutest atom, more subtle than the subtlest thing." But it must not be inferred from this that they are materialists; for they maintain an essential distinction between the phenomena of matter and spirit.

They believe that the soul is a portion of the Supreme Being, and has a separate individual existence. It is distinguished from the Creator by not possessing essentially and permanently the qualities of perception, desire, and action; and it is, moreover, subject to ignorance and sorrow, but the supreme spirit is perfect and eternally blessed. "Truth and intelligence," to use their own words, "are the attributes of God, and are not to be ascribed to the soul, which is the subject both of knowledge and ignorance, pleasure and pain; by which it is distinguished from the supreme spirit; therefore God and the soul are entirely distinct beings. If this be denied, how can you account for the soul being confined to material habitations, and again released from them?"

While embodied in matter, the soul is under the influence of evil passions, but having, by intense study and contemplation, arrived at the knowledge of the natural elements and principles, it attains the place of the eternal. In this state of beatitude, its individuality does not, however, cease; but on this difficult point they express themselves very obscurely.

They

They admit that the soul is united to the Supreme Being, but conceive that it still retains the abstract nature of definite or visible existence.

The dissolution of the world proceeds from the destruction of the visible forms and qualities of things, but their material essence remains, and from it new worlds are formed by the creative energy of the Almighty; and thus the universe is dissolved and renewed in endless succession. This theory is not, however, confined to the sect that is the subject more particularly of this article; but is common, under some modification or varied expression, to others of their schools. Under the article *PHILOSOPHY of the Hindoos*, some general information will be found on these points, and some details under the several articles thence referred to.

What is here said, taken chiefly from the Prabod'h Chandrodaya, may more than suffice as to the theory ascribed to Gautama; whose doctrines, as far as they are comprised in works said to be his, are related in a very succinct manner, and in a strictly syllogistic style, but are immersed and lost almost in an endless mass of exposition and commentary. The name of this logician is variously pronounced in different parts of India, and his doctrines are variously expounded. He is said to have been raised to divine honours, and to be the same with the Godama of the Birman empire. (See *GODAMA*.) And if so, but the fact may be reasonably doubted, he is identified with the Boodh, or Budha, so extensively worshipped in Asia. See *BOODH*.

NYBE, in *Geography*, a town of Sweden, in North Jutland; N. lat. 56° 59'. E. long. 9° 39'.

NYBELLED, a town of Sweden, in the province of Smaland; 43 miles N.N.W. of Calmar.

NYBORG, or NYEBORG, a sea-port town of Denmark, on the E. coast of the island of Funen, in a bay of the Great Belt, surrounded with a rampart and a ditch. The fortifications, as well as the castle, are now in a state of dilapidation; and a palace which was formerly the residence of the kings of Denmark, is in ruins. The inhabitants derive their subsistence partly from passengers who daily cross from and to Corsoer in Zealand, and partly from an inconsiderable commerce. The ships that navigate the Great Belt pay toll here, for which purpose a man of war is always stationed in the Belt; 16 miles W. of Corsoer. N. lat. 55° 22'. E. long. 10° 48'.

NYBY, a town of Sweden, in East Gothland; 28 miles W. of Linköping.

NYCHINTA, a town of Bengal; 30 miles N. of Mauldah.

NYCLEE, a town of Hindoostan, in Bahar; 15 miles N.W. of Chuprah. N. lat. 26°. E. long. 84° 31'.

NYCTAGES, or NYCTAZONTES, derived from νύξ, *night*, a religious sect, distinguished by their inveighing against the practice of waking in the night, to sing the praises of God; in regard, said they, the night was made for rest.

NYCTAGINES, in *Botany*, a natural order of plants in Jussieu, the 3d of his 7th class, named from his *Nyctago*, the *Mirabilis* of Linnæus, which is one of the number.

This 7th class consists of dicotyledonous plants without a corolla, whose stamens are inserted below the germen. Their *calyx* is inferior, of one or many leaves. *Corolla* generally none; sometimes there are petal-like scales, below the germen, either bearing the stamens, or alternate with them; sometimes there is even a petal-like inferior tube, not bearing the stamens, often withering; or bearing the stamens, being formed of their combined filaments. *Stamens* inferior, that is inserted below the germen, definite in number, their filaments distinct, or more rarely monadelphous. *Germen* superior, simple; style one, or several, of a definite

number, or wanting; stigma either simple or manifold. *Seed* either solitary, or the capsule superior, of one or two cells, with one or several seeds.

The *Nyctagines* are thus defined.

Calyx tubular, resembling a corolla, either naked externally, or surrounded by a small outer calyx. *Germen* one; style one; stigma simple. *Stamens* definite, inserted into a gland which surrounds the germen, and originates from the receptacle. *Seed* one, covered by the gland, as well as by the bottom of the tube of the calyx, both of them being permanent. *Corculum* surrounding a farinaceous mass. *Stem* either shrubby or herbaceous. *Leaves* opposite or alternate. *Flowers* axillary and terminal.

The genera are *Nyctago* (which is *Jalapa* of Tournefort, *Mirabilis* of Linnæus, *Nyctage* of Van Royen, a multiplicity of names to little purpose); *Abronia*, Juss. 448. Lamarck Illustr. t. 105. (*Tricatus* of Willd. Sp. Pl. v. 1. 807.); *Boerhavia*; *Pisonia*; and *Buginvillea* of Commerçon, Lamarck Illustr. t. 294. To these are to be added *Oxybaphus* of L'Heritier, Willd. Sp. Pl. v. 1. 185. Curt. Mag. t. 434. See *OXYBAPHUS*.

NYCTAGO, so called by Jussieu, from νύξ, *night*, and ἄγω, *to bring*, or *to be concerned with*, because the flowers expand, and are fragrant at that time only, whence the French name of Belle-de-nuit for the same plant. See *MIRABILIS* and *NYCTAGINES*.

NYCTALOPIA, νυκταλωπια, in *Medicine*, signifies, in the writings of the more accurate authors, *night-blindness*, or that affection of the sight, which renders the patient incapable of perceiving objects after sun-set. The word stands in opposition to *HEMERALOPIA*, or *day-blindness* (which see); and is probably derived from νύξ, *the night*, and αλωψ, which consists of α with the privative α.

We have stated, however, in the article just referred to, that there is a wide difference in the acceptation, in which both ancient and modern writers have used this term; some considering the *nyctalopia* as *night-blindness*, while others interpret it *night-sight*, and both of course using the word *hemeralopia*, in like manner, in opposite significations. Galen, Paul of Ægina, Aëtius, Pliny, and Celsus, consider the term in the light in which we have defined it. Hippocrates, on the contrary, had spoken of *nyctalopes*, as persons who saw most perfectly in the night: οἱ δὲ τῆς νυκτὸς ὀρῶντες, ἔς δὲ νυκταλωπες καλοῦμεν. Περὶ ὁφθ. II. Again, the author of Med. Definit., ascribed to Galen, defines *nyctalopia*, *night-sight*; while the author of the *Isagoge*, attributed to the same, affirms that it is properly used in either sense.

The *night-blindness* appears to arise from a diminution of sensibility in the retina of the eyes, so that the impression of a strong light only is capable of producing the sensation of vision. Hence professor Scarpa has considered the disease as an "imperfect amaurosis." In the complete amaurosis, the retina is altogether insensible to the impressions of light; the patient is totally blind under all circumstances, although no material morbid appearance is visible in his eyes. But in the *nyctalopia*, he sees perfectly well during the broad day-light only; and, as the dusk of evening advances, he finds all objects begin to appear indistinct, as if a gradually thickening mist were interposed between them and his eyes; and the light of candles, or of the moon, is altogether imperceptible. He remains, therefore, *blind* until the approach of sun-rise in the morning, when objects again begin to appear to him, enveloped in a mist, which gradually vanishes, as the sun advances to the horizon; after which his sight becomes as perfect as that of other individuals, during the light of day.

This morbid condition of the retina is sometimes congenital, and therefore constitutional, and altogether beyond the

reach of any curative measures. It has sometimes been hereditary, and sometimes, as in an instance known to the writer of this article, it has occurred in two children of the same family. A case of congenital nyctalopia, which had continued many years without change, and independently of any disease, is related by Dr. Parham. See *Med. Observat. and Inquiries*, vol. i. p. 122, note.

Most commonly, however, the nyctalopia is a disease of the retina, induced by temporary and accidental circumstances, and capable of being removed by medicine. It is brought on, in these cases, by various causes which debilitate the constitution, in individuals of very irritable habit; and is sometimes one among the various symptoms, called *nervous*, which occur in hysterical and hypochondriacal patients. Most frequently, however, it seems to be occasioned by sympathy with a deranged state of the stomach and bowels, or of the hepatic system; and the German practitioners, especially the able surgeons Schmucker and Richter, and after them the celebrated Italian surgeon, Scarpa, have shewn, that the disease is readily removed by correcting the condition of these abdominal viscera, particularly by the free use of purgatives, after emetics. (See Scarpa on the Diseases of the Eyes, translated by Briggs, chap. 19.) In this view of the subject, the nyctalopia is to be considered as analogous to the vertigo, head-ache, ringing of the ears, and other nervous affections of the head, which accompany indigestion, and requires to be treated by similar means. (See INDIGESTION.) The recommendation of strong emetics, which the foreign surgeons direct to be repeatedly administered, is perhaps the result of hypothetical notions, relative to the *jaburra* of the stomach, rather than of careful observation; and it is probable that their active stomachic purgatives, composed of rhubarb and antimony, with stimulant gums, were the most valuable remedies.

In consequence of the *periodical* returns of the blindness every evening, some practitioners have suggested the propriety of administering the Peruvian bark, which is peculiarly remedial in intermittent disorders in general. But these practitioners have failed to observe, that there is no periodical or intermittent change in the organ of vision; the intermissions are exclusively confined to the external circumstances, *viz.* to the abstraction and return of the light. Accordingly Scarpa has justly remarked: "with respect to the *imperfect periodical amaurosis*, every practitioner would be disposed to believe that the cinchona ought to be the specific; experience, however, has proved the contrary, and convinced us that this excellent remedy, which is so efficacious in intermittent fevers, and other periodical diseases, rather aggravates this complaint, and renders its attacks more frequent, and of longer duration than before. It is, on the contrary, most frequently cured in a short time, by emetics and internal resolvents, after which corroborants and bark become useful."

NYCTANTHES, in *Botany*, derived from νυκτος ανθος, *the flower of the night*, because, says Gerarde, "its most odoriferous and sweet-smelling flowers flourish and shew themselves only in the night time, and in the day time look withered and with a mourning cheer." Linn. Gen. 9. Schreb. 12. Willd. Sp. Pl. v. 1. 35. Mart. Mill. Dict. v. 3. Ait. Hort. Kew. ed. 2. v. 1. 15. Juss. 104. Lamarck Illustr. t. 6. (Parilium; Gært. t. 51. Scabrita; Linn. Mant. 3. Schreb. 66. App. 819.) Class and order, *Diandria Monogynia*. Nat. Ord. *Sepiaria*, Linn. *Jasminae*, Juss.

Gen. Ch. *Cal.* Perianth inferior, of one leaf, tubular, truncated, entire, permanent. *Cor.* of one petal, salver-shaped; tube cylindrical, the length of the calyx; limb five-

cleft, spreading, the segments two-lobed. *Stam.* Filaments two, in the centre of the tube, very short; anthers oblong, as long as the tube. *Pist.* Germen superior, nearly ovate; style thread-shaped, the length of the tube; stigmas two, acute. *Peric.* Capsule obovate, compressed, with an emarginate point, coriaceous, two-celled; cells parallel, compressed, without valves. *Seeds* solitary, obovate, convex on one side, flat on the other, attached to the bottom of the cell.

Obf. The corolla is usually five-cleft, but Schreber has seen it with six, or even seven, segments, and Linnæus with only four. The latter found four stamens.

Ess. Ch. Corolla salver-shaped, with truncated segments. Capsule two-celled, margined. Seeds solitary.

1. *N. Arbor tristis*. The Sorrowful tree, or Indian Mourner. Linn. Sp. Pl. 8. (*Arbor tristis*; Clus. Exot. 225. 279. Ger. em. 1527. *Myrto similis*; Bauh. Pin. 469. Manjapumeran; Rheede Hort. Malab. v. 1. 35. t. 21.)—Native of sandy deserts in the East Indies; and introduced at Kew in 1781, by sir Joseph Banks. This tree rises to the height of more than twenty feet, with thick and shady, but widely scattered branches. Trunk from one to two feet in diameter, covered with an ash-coloured bark. Branches square and knotty. Leaves opposite, nearly sessile, ovate, pointed, entire, rugged. Flower-stalks axillary, opposite, solitary, about half as long as the leaf, saffron-coloured, terminated by three small bunches of flowers, of a white or yellowish colour, like those of Jasmine, and very highly fragrant at night.

Gerarde tells us "there is made of the splinters of the wood certain tooth-picks, and many pretty toys for pleasure." The flowering branches are used in the East for garlands and crowns, and a fragrant water may be distilled from them.

Linnæus founded his *Nyctanthes* upon the number of segments of the corolla being about eight, without regard to the fruit, of which he was in most cases ignorant. Recent authors with more propriety refer to *Jasminum* all the species that have a pulpy fruit; the divisions of the corolla being found variable in both genera.

NYCTANTHES, in *Gardening*, comprises plants of the shrubby exotic flowering kind, of which the species cultivated is the square-stalked nyctanthes (*N. arbor tristis*); but other species may be cultivated for variety.

Method of Culture.—This plant may be increased by layers and cuttings. The layers may be laid down in the early part of the summer, in the usual method, being made from the young branches, plunging the pots containing them in a bark hot-bed. And the cuttings should be taken from the young shoots, be planted out at the same time, and managed in the same manner.

The plants, when fully rooted in either way, may be removed into separate pots. They should have due supplies of water, and be pruned and removed into larger pots, as there may be occasion.

These plants are very ornamental and fragrant among other potted tender plants.

NYCTELIA ORGIA, formed from νυξ, *night*, and τελεω, *to perform*, feasts in honour of Bacchus; so called, because held in the night-time.

A great part of the ceremony consisted in running through the streets with the bottle and glass in hand, and drinking: but there was no impurity unpractised in them.

The Athenians celebrated the nyctelia every three years, at the beginning of the spring.

NYCTHEMERON, Νυχθημερον, the natural day. See DAY.

NYCTI-

NYCTICORAX, in *Ornithology*, a species of *Ardea*.
See **HERON**.

NYCTOSTRATEGI, *Nυκτος στρατηγοι*, among the *Ancients*, officers appointed to prevent fires in the night-time.

At Rome they had the command of the watch, and, from their number and office, were called *nocturni triumviri*.

NYD, in *Geography*, a river of Norway, which runs into the North sea, in the bay of Drontheim.

NYDALA, a town of Sweden, in the province of Smaland; 26 miles S. of Jonkioping.

NYDAU, a town of Switzerland, in the territory of Bienne, at the N.E. extremity of the lake of Bienne, on the S. side of the Tiel canal, opposite to Bienne.

NYE, **PHILIP**, in *Biography*, an eminent English non-conformist divine, who distinguished himself by his zeal in support of the parliament against king Charles I., and during the discussions in the assembly of divines at Westminster, was descended from a good family in Suffex, and born about the year 1596. He was educated and took his degrees at Oxford. Afterwards he entered holy orders, and was appointed, in 1630, to officiate at St. Michael's church, Cornhill, in London. In this situation he continued till he became obnoxious to the censures of the episcopal court, by his refusing to comply with the impositions of archbishop Laud. To escape persecution, he fled into Holland, in 1633, and continued abroad during about seven years. When the parliament seemed to prevail over the interest of the king, he returned, and immediately, under the patronage of the earl of Manchester, became minister of Kimbolton, in Huntingdonshire. In 1643 he was zealously active in Scotland, in procuring the assistance of the natives, that the taking of the solemn league and covenant might be expedited, and after his return, he sat as a member in the famous assembly of divines at Westminster, in the selection of whom he had a considerable influence. When the resolution for taking the covenant passed the assembly and both houses of parliament, Mr. Nye was one of the persons appointed to officiate before those bodies. On the day fixed for subscribing it, the two houses, and the assembly being met in the church of St. Margaret, Westminster, he spoke in justification of taking the covenant from scripture precedents, and displayed the advantages which the church had received from such sacred combinations. He then read it from the pulpit with an audible voice, article by article, each person standing uncovered, with his right hand lifted up bare to heaven, worshipping the name of God, and swearing to the performance of it. For his great services on this occasion, and as a reward for his journey into Scotland, he was presented to the rectory of Acton, near London. Mr. Nye was one of the committee who drew up the preface to the Directory, which was ordered to be substituted in the room of the Common Prayer book; but when it was determined to establish a Presbyterian form of government, he openly avowed and vindicated his dissent from it, and contended for the scheme of independency, *viz.* "that every particular congregation of Christians has an entire and complete power of jurisdiction over its members, to be exercised by the members thereof within itself." Mr. Nye interested himself much in political affairs, and he was often consulted by men in power. In 1647 he was appointed one of the chaplains who attended the commissioners empowered to treat with king Charles I. in the Isle of Wight; and Anthony Wood says, that about the same time he was employed to obtain subscriptions from the London apprentices, &c. against a personal treaty with the king, while the citizens of the metropolis were petitioning for one. In the year 1653 he was appointed one of the *tryers* for examining

into the qualifications and characters of ministers; and in 1654 he was nominated one of the assistants to the commissioners for ejecting insufficient ministers and school-masters. He was one of the principal managers in the assembly of the congregational churches appointed to meet in the Savoy, in 1658, which consisted of ministers and messengers from more than a hundred churches in England: the result of their meetings was, "A Declaration of the Faith and Order owned and practised in the Congregational Churches in England, &c." Soon after the restoration of king Charles II. he was ejected from his living, and afterwards preached privately to a congregation of dissenters, as opportunity offered, till the year 1672, when he died, about the age of seventy-six. He was author of many works, the titles of which may be seen in the Biog. Brit. and Gen. Biog. to which, and to Toulmin's Neale, we refer our readers.

NYEBYE, in *Geography*, a town of Denmark, on the E. coast of the island of Taasinge. N. lat. 54° 57'. E. long. 10° 40'.

NYED, a town of Sweden, in the province of Warmland; 18 miles N.N.E. of Carlstadt.

NYEKIOBING, an ancient town of Denmark, in the island of Falster, on a narrow channel opposite to Lalande. This large and well-built town is situated in the strait which divides Falster from Moen; fortified on the land side by a wall and ditch, and carrying on a considerable trade. The royal palace is a great ornament to the town. N. lat. 54° 46'. E. long. 11° 51'.—Also, a town of Denmark, on the N. coast of the island of Zealand, in the gulf of Isefjord, having a good harbour and considerable commerce. N. lat. 55° 55'. E. long. 11° 41'.

NYEVRE, or **NIEVRE**, formerly *Nivernois*, one of the nine departments of the central region of France, in N. lat. 47° 10', deriving its name from that of a river, which rises near Champigny, and runs into the Loire at Nevers, and bounded on the N. by the department of the Yonne, on the E. by the departments of the Côte d'Or, and Saône and Loire, on the S. by the departments of the Saône and Loire, and the Allier, and on the W. by the department of the Cher. It is 24 French leagues in length, and 23 in breadth, comprehends 7365 kilometres, or 362 square leagues, and 251,158 inhabitants, and is divided into 4 circles, 25 cantons, and 330 communes. The circles are Cosne, including 57,788 inhabitants; Clamecy, 65,465; Nevers, 77,596; and Chateau-Chinon, 50,309. According to Haslenfratz, the number of circles is 9, of cantons 47, and of inhabitants 235,699. The capital is Nevers. Its contributions, in the 11th year of the French era, were 2,145,555 fr., and its expences 218,836 fr. 66 cents. The soil of this department, in general, yields grain, wine, flax, fruits, and pastures; but that of Chateau-Chinon is of a bad quality. It has mines of iron and coal, marble quarries, and mineral springs.

NYFFE', a country of Africa, S. of Cashna, united with Cabi.

NYKEE, a town of Africa, and capital of a district in Melli, situated on the road from Kong to Cashna. N. lat. 14° 45'. E. long. 9° 20'.

NYKIRKE, a town of Sweden, in East Gothland; 24 miles N.W. of Linkioping.

NYKOPING, a town of Sweden, in Sudermanland; 49 miles S.W. of Stockholm. N. lat. 58° 45'. E. long. 16° 53'.

NYKYL, a town of Sweden, in East Gothland; 10 miles S.S.W. of Linkioping.

NYKYRKA, a town of Sweden, in the government of Abo; 30 miles N.W. of Abo.

NYLACKY, one of the Banda islands. S. lat. $4^{\circ} 11'$. E. long. $130^{\circ} 33'$.

NYLAND, the S.E. province of Finland, lying in N. lat. $60^{\circ} 30'$; and being from 15 to 18 leagues from N. to S., and 40 from W. to E., along the N. coast of Finland gulf. It is a level, fertile, and, in general, well-cultivated country. Its capital is Helsingfors. The inhabitants of this province subsist by agriculture, grazing, and fishing.

NYL-GHAU, in *Zoology*, an animal brought from the East Indies, and described for the first time by Dr. Hunter. The name denotes a blue cow, or rather a bull, *ghau* or *gau* being a masculine. Most of these animals that have been brought to England have been received from Surat or Bombay; and it is conjectured, that they are indigenous in the province of Guzerat. The nyl-ghau is larger than any ruminant of this country, except the ox; its flesh will probably be found delicious; and if it should prove docile enough to be easily trained to labour, its great swiftness, with considerable strength, might be applied to valuable purposes. In size it seems to be a mean between black cattle and deer; being as much smaller than the one, as it is larger than the other; and in its form there is a very evident mixture of resemblance to both. Its body, horns, and tail, are not unlike those of a bull, and the head, neck, and legs, are very like those of a deer. Some have made this animal a species of the antelope, (the *Antelope pida*;) but Mr. Hunter, who dissected it, apprehends that it is a new species. The colour, in general, is ash or grey; from a mixture of black hairs and white; most of them are half white towards the root, and half black; the height of the back is about four feet, and the trunk, from the root of the neck to the pendulous tail, is about the same length; along the ridge of the neck and back the hair forms a short and thin upright mane; the legs are small in proportion to their length; the neck is long and slender as in the deer, and when the head is raised, it resembles the Italic *S*; at the throat there is a shield-like spot of beautiful white hair; and lower down, on the beginning of the convexity of the neck, there is a mane-like tuft of long black hair. There are six grinders on each side of the jaw; and four incisores in each half of the lower jaw; the horns are seven inches long, and of a triangular shape. The nyl-ghau eats oats, is fonder of grass and hay, and more fond of wheat bread. When thirsty, it would drink two gallons of water. It is vicious and fierce in the rutting season, but at other times tame and gentle. The female differs so much from the male, that we should scarcely suppose them to be the same species. She is much smaller, both in height and thickness. In her shape and yellowish colour she very much resembles deer, and has no horns; yet has four nipples, and is supposed to go nine months with young; she has commonly one at a birth, and sometimes twins. The young male nyl-ghau is like the female in colour, and therefore like a fawn.

The first of these animals that were ever brought to England, were sent from Bombay to lord Clive, in 1767; they were male and female, which bred every year. For a more minute description of this animal, see Phil. Transf. vol. lxi. part i. art. 21.

NYLODESE, or NEW LODESE, in *Geography*, a town of Sweden, in West Gothland, situated on the North sea; formerly flourishing and governed by its own laws; but being burnt by the Danes in 1611, the inhabitants withdrew to Almgfahs.

NYMPH, NYMPHA, in *Mythology*, a sort of heathen divinity, supposed to preside over waters, rivers, and fountains.

The word comes from *νύμφη*, a bride, or woman newly married; and was applied to these deities because represented under the figure of young maids. Though others derive nymph from *lymphæ*, water, on account of their inhabiting near the waters. See LYMPHATI.

Some extend the name nymph farther, and comprise under it the goddesses of the fountains, forests, and trees; called particularly, Oreades, Dryads, and Hamadryads; as well as those of the sea, called Nereids, and those of the air, called Auræ.

Meursius is of opinion, the Greeks borrowed their notion of these divinities from the Phœnicians; for *nymphæ*, the same with *nephar*, in their language, signifying soul. The Greeks imagined that the souls of the ancient inhabitants of Greece wandered much about the tombs where their bodies were interred, or in the places which they had frequented during their abode in this world; and accordingly were become nymphs; particularly, that the souls of those who had inhabited the woods were called Dryads; those who had inhabited the mountains, Oreades; those who had dwelt on the sea-coasts, Nereids; and, lastly, those who had their place of abode near rivers or fountains, Naiads.

This opinion is confirmed by the prevalent notion, that the stars and higher parts of the universe were so many animated beings; and that tutelar deities were assigned to the earth, the groves, the mountains, and the rivers. Accordingly, this is supposed to be the original of those divinities; but in later ages, women of all sorts, from the lady of distinction to the simple shepherdes, who had been concerned in any adventure, were denominated nymphs. According to Servius, the number of the nymphs was reduced to 200. Hesiod reckons 300 of them, and, indeed, their number seems to have been indefinite. Thus our poets, faithful copiers of the reveries of the ancients, frequently give the name of nymphs to the illustrious women who enter into the subjects of their poems. Diodorus (l. 3.) says, that the wives of the Atlantes were commonly called nymphs; whence it has been concluded, that this was the country where the opinion of the existence of those goddesses took its rise, because the place where the souls of heroes were said to dwell after death was in the delightful gardens of Mauritania Tingitana, or near mount Atlas. The Pagans did not believe these pretended divinities to be immortal; but they were supposed to be very long-lived. Hesiod makes them live several thousand years. Plutarch has determined the number of years to be 9720. The nymphs, napeæ, and naiads, had their sacrifices, sometimes of goats and lambs that were offered them, with libations of wine, honey, and oil; frequently of nothing but milk, fruits, and flowers.

NYMPH-Animal, in *Natural History*, one of the terms used by Swammerdam, in his classing the insects according to their states and productions. It expresses those creatures, which are produced in their perfect form from the egg, and are subject to no changes of any kind afterwards. See ENTOMOLOGY and INSECTS.

NYMPHA is sometimes used for the little skin with which insects are inclosed; both while they are in the egg, and after they have undergone the first apparent transformation. See INSECTS.

NYMPHA is more frequently used by naturalists for the insects themselves, while they have yet only the form of worms or maggots.

The word properly signifies bride or a new-married woman; it being now, when it has laid aside its former skin, that it begins to shew all its parts distinctly. In this change it loses its motion for a while, as when in the egg; so that these insects are twice in their nymph state, first in the maggot,

maggot, which is their first nymph; and again in this change, which is their second. See AURELIA.

The only difference between the two nymph states consists in this, that in the latter the members appear more distinctly. Swammerdam calls this latter nymph aurea or aurelia, and chrysalis; and the former simply nymph. The nymphæ are otherwise distinguished into vermiformes and oviformes. See ENTOMOLOGY.

NYMPHÆ, in *Anatomy*. See GENERATION.

NYMPHÆA, in *Botany*, νυμφαία of Theophrastus and Dioscorides, was so called, with much taste, in allusion to the nymphs, supposed to inhabit the pure and limpid waters in which it grows; nor was it an unworthy emblem of the elegance and delicacy attributed to those imaginary beings. Linn. Gen. 264. Schreb. 352. Willd. Sp. Pl. v. 2. 1151. Mart. Mill. Dict. v. 3. Sm. Prodr. Fl. Græc. v. 1. 360. Fl. Brit. 569. Dryand. in Ait. Hort. Kew. ed. 2. v. 3. 292. Juss. 68. Lamarck Illustr. t. 453. f. 1. Gært. t. 19, alba. (Castalia; Salis. in Ann. of Bot. v. 2. 71.)—Class and order, *Polyandria Monogynia*. Nat. Ord. *Hydrocharitaceæ*, Juss. *Nymphæa*, Salis.; an order between the *Ranunculaceæ* and *Papaveraceæ* of Jussieu. Linnaeus placed this genus in his 54th order, most justly termed *Miscellanea*! He next in manuscript referred it to his *Rhoeadeæ*, which he afterwards erased, substituting a suspicion of its affinity to *Asarum*. In his *Prælectiones*, published by Giseke, it stands next to *Sarracenia*, (always in his idea nearly connected with it,) in the *Succulentæ*, to which surely it is little related. We heartily concur with Mr. Salisbury's decision concerning the affinity of the genus, though not in the name, which he has transferred from the true plant of the ancients, and replaced by *Castalia*, a word incorrect in etymology as well as meaning, and altogether superfluous. See NUPHAR.

Gen. Ch. *Cal.* Perianth inferior, of four or five large, oblong permanent leaves, coloured on the upper side. *Cor.* Petals numerous, nearly the length of the calyx, oblong, spreading, inserted in several rows, upon the lower part of the germen. Nectary globose, sessile, in the middle of the stigma. *Stam.* Filaments very numerous, inserted upon the germen, in several rows, above the petals, linear, flat spreading; anthers oblong, on the upper side of each filament, opening by two linear fissures above. *Pist.* Germen superior, large, globose; style none; stigma orbicular, many-cleft, radiated above, permanent, bearing the nectary. *Peric.* Berry globose, with a hard coriaceous coat, internally spongy, with numerous cells. *Seeds* very numerous, roundish, polished.

Effl. Ch. Calyx of four or five leaves. Petals numerous, inserted into the germen below the stamen. Stigma radiated, many-cleft, sessile, with a central nectary. Berry superior, of many cells. Seeds numerous.

Obs. Many of the distinctions between this genus and *Nuphar* were perceived by Linnaeus, and all of them are detailed in the *Flora Britannica*, except what regards the nectaries, for which we are indebted to Mr. Salisbury. No genera can be better defined. As the flowers of *Nuphar* are always yellow, those of *Nymphæa* are white with more or less inclination to red or blue; in some instances of a very fine crimson. In the *Prodr. Fl. Græc.* we have said that *Nymphæa* is gynandrous, but it is best perhaps to restrict that term to flowers whose stamens or anthers grow really out of the style or stigma, altogether above the germen.

1. *N. alba*. Common White Water-Lily. Linn. Sp. Pl. 729. Willd. n. 3. Ait. n. 1. Engl. Bot. t. 160. Fl. Dan. t. 602. Matth. Valgr. v. 2. 245. Camer. Epit. 634.

Ger. em. 819. (*N. candida*; Fuchf. Hist. 535. *Nenuphar secunda*; Brunf. Herb. v. 1. 37.)—Leaves heart-shaped, entire; even beneath. Petals elliptic-oblong. Stigma of sixteen ascending rays. Root horizontal, creeping.—Native of clear pools, the margins of lakes and of quiet rivers, throughout Europe, flowering in June and July. This is unquestionably the true νυμφαία of Dioscorides, who compares its white flowers to a lily, and mentions the saffron-like threads in the middle, as well as the resemblance of its fruit to a round apple, or poppy-head. The modern inhabitants of Zante call it νεροκολοκυθιά, or Water Gourd. Dr. Sibthorp found it frequently in Greece and the neighbouring countries. In England it often occurs in still pools on heaths, or under the shade of trees, completely mantling over the water with its broad floating, or partly immersed leaves, which are of an elliptical outline, with a deep straight notch at the base, to receive the footstalk. The flower-stalks are all radical and simple, as in the genus *Nuphar*, each being one large, concave, most elegant white flower, four or five inches wide, of numerous elliptical petals lying over each other. The upper side of the calyx is often tinged with a blush-colour. The stamens and pistil are yellow. These flowers have little or no scent. They are celebrated for closing in the afternoon, and lying down upon the water, or sinking somewhat below its surface during the night. In the middle of the forenoon they rise some inches above the surface, and expand. This phenomenon is chiefly observable in hot bright weather, and is doubtless owing to the action of light upon the flower, which easily rises or falls in consequence of the oblique direction of the long and slender stem. Since the fact has, for some reason or other, been controverted, we have carefully verified it.

2. *N. odorata*. Sweet White Water-Lily. Willd. n. 4. Ait. n. 2. Sims in Curt. Mag. t. 819. Andr. Repof. t. 297.—Leaves heart-shaped, entire; the nerve and veins prominent beneath. Petals linear-oblong. Stigma of sixteen to twenty upright rays, inflexed at their points. Root horizontal, creeping.—Native of North America; not unfrequent here in the more curious gardens, but scarcely hardy enough to bear a succession of our winters. It flowers in June and July. This is rather smaller in all its parts than the foregoing, and is distinguished by the sweet hawthorn-like scent of the flowers, which have not been observed to sink under water at night, in this country. The prominent veins of the leaves distinguish them, even when dried, from the *N. alba*, and their outline is rather more orbicular than elliptical.

3. *N. nitida*. Siberian, or Cup-flowered, Water-Lily. Sims in Curt. Mag. t. 1359. Ait. n. 3. (*N. n. 11*; Gmel. Sib. v. 4. 183. t. 71; excluding the synonyms.)—Leaves heart-shaped, entire; the nerve and veins not prominent beneath. Stigma of twelve to twenty upright rays, inflexed at their points. Root vertical.—Native of Siberia. Mr. W. Anderson introduced it, in 1809, to the collection of James Vere, esq., where the plant was found to require heat to keep it alive. In the *Hort. Kew.* it is marked hardy, flowering in July and August, and said to come from Siberia, as we presume, on the authority of Gmelin's synonym. This much resembles the last, but the flowers are less expanded, without scent, the veins of the leaves rather sunk or furrowed, and the tuberous part of the root, as Mr. Anderson observes, not horizontal nor creeping, but perpendicular, and ascending.

4. *N. pygmaea*. Pigmy Water-Lily. Ait. n. 4. (*Castalia pygmaea*; Salis. Parad. t. 68.)—Leaves heart-shaped, entire. Stigma of seven or eight inflexed rays.—Native of

of China; introduced in 1805. *Ait.* We received it at Kew in May 1811, when it was flowering plentifully in a tub in the stove. This species is but about half the size of any other one as yet discovered. Of its *root* we have no information. The *leaves* are about two inches broad, with usually distant lobes; their veins sunk. *Stalks* slender. *Flowers* white, with a slight sweetness. *Stamens* yellow, the outer ones much dilated, or obovate, below the anther, and gradually becoming broader and paler, till they assimilate entirely with the *petals*, as is the case more or less in others of this genus.

5. *N. Lotus*. Egyptian Lotus Water-Lily. Linn. Sp. Pl. 729. Willd. n. 6. Ait. n. 5. Sims in Curt. Mag. t. 797. Walldt. and Kitaib. Hung. v. 1. 13. t. 15. (*Lotus ægyptia*; Alpin. Exot. 213—229. Δαλός αἰγυπτίος, Diosc. book 4. chap. 114.)—Leaves somewhat peltate, sharply toothed, smooth on both sides, without dots; the veins prominent and reticulated.—Native of Egypt and Hungary. Mr. Loddiges, who obtained seeds from the last-mentioned country in 1802, was informed that it inhabited warm springs, equal to the 95th degree of Fahrenheit. Our Egyptian specimen, from Dr. Delile, is far more luxuriant than what is drawn in the Bot. Mag. This species differs from all we have hitherto described, in the strong sharp teeth of the edges of its *leaves*, whose veins moreover are very much branched, elevated on both sides, and strongly reticulated. The outline of the *leaf* is elliptical, or nearly orbicular, cloven at the base into two deep parallel lobes, whose division seldom extends quite so far as the insertion of the *footstalk*. Both surfaces are smooth; the upper polished. *Flowers* larger than in our *N. alba*, white; the *calyx* ribbed; the outer *petals* tinged sometimes with a faint red, and furnished with a green keel. *Stamens* somewhat dilated. Rays of the *stigma* 27 in our wild specimen, apparently spreading. The ancients record the sinking of the *flowers* under water at night, as in the *N. alba*. The Egyptians fed upon the *roots* and *seeds*, both of which abound with farinaceous matter. We have always conceived that this *flower* became sacred to superstitious veneration, in that country, in consequence of its resemblance to the true East Indian Lotus, see CYAMUS and NELUMBO. The latter, from the mode of its vegetation, was adopted, in the most remote ages, to serve as an emblem of fertility; but our *N. Lotus* exhibits nothing which could originally have excited such an idea. It seems therefore a sort of substitute or type; and, if we mistake not, strengthens the theory of the mythology of Egypt having migrated thither from India. The *Cyamus* plant was indeed brought to Egypt, but has never perpetuated itself there to any great extent, nor is it now to be found in that part of the world. In the herbarium of the younger Linnæus is a specimen marked *N. Lotus Americana*, which appears really to belong to this species. The *leaf* measures two feet across. The *anthers* are remarkably long and narrow. We presume that this specimen came from the West Indies. No mention of any thing like it occurs in Michaux, Walter, or Swartz, but it seems the plant of Sloane and Browne, cited by Linnæus under *N. Lotus*.

6. *N. pubescens*. Indian Lotus Water-Lily. Willd. n. 7. Ait. n. 6. (*N. Lotus*; Andr. Repof. t. 391. *N. indica*, foliis amplis, elegantè ad ambitum crenatis, subtus fulvâ lanugine tectis flore albo simplicibus, Madagafcatan; Pluk. Almag. 267. Ambel; Rheede Hort. Malab. v. 11. 151. t. 26.)—Leaves somewhat peltate, sharply toothed; downy, with prominent reticulated veins, beneath; even above; their lobes divaricated, acute.—Native of the East Indies, from whence Sir Joseph Banks procured it for Kew garden

in 1803. We had specimens from N. E. Kinderfley, esq. in 1793. This differs essentially from the last, in having the back of the *leaves* clothed with fine dense velvet-like down; and the veins not prominent on the upper surface. Their *flowers* seem nearly to agree. The rays of the *stigma* in the present are inflexed. We cite Mr. Andrews on the authority of Hort. Kew. only, as there is nothing in his account to verify the synonym. On the contrary, he copies from Willdenow the characters of *N. Lotus*, which do not suit our plant, nor is the very peculiar character of the downiness of the *leaves* indicated, though their divaricated sharp lobes are well expressed. Probably the able writer of his letter-press saw the drawing only, not the plant.

7. *N. rubra*. Red Water-Lily. Ait. n. 7. Andr. Repof. t. 503. Sims in Curt. Mag. t. 1280.—β, with paler flowers; Sims in Curt. Mag. t. 1364.—Leaves somewhat peltate, sharply toothed; downy, with prominent reticulated veins, beneath; and prominent ribs above; their lobes divaricated and acute.—Native of the East Indies, from whence it was sent by the indefatigable and intelligent Dr. Roxburgh. It is cultivated in the stove, increasing much by root, and blooming freely in July and August. The vivid crimson of the *petals*, which however appears by the Bot. Mag. to vary in intensity, at once distinguishes this from the last, with which the pubescence of the *leaves* accords. Their colour and stains seem to us variable. If the prominence of the ribs, and, more or less, of the veins, on their upper side does not prove a sufficient specific character, we know not, as yet, of any better. The *seeds* and *roots* are said to be eatable, and the *flower* to be held in superstitious veneration in Hindoostan, which may arise from its affinity to the *Cyamus*, the sacred *Tamarà* of that country.

8. *N. versicolor*. Changeable Water-Lily. Ait. n. 8. Sims in Curt. Mag. t. 1189.—Leaves somewhat peltate, bluntly toothed, blistered on both sides; their lobes approximated and rounded.—Found in the East Indies by Dr. Roxburgh, and raised by Mr. W. Anderson at Mr. Vere's in 1807, where it flowers in the stove about August. We have seen no specimen, but by the Bot. Mag. this is evidently a most distinct species. The *root* propagates itself by tubers, like the potatoe, each tuber flowering but once. The *leaves* are nearly orbicular, bluntly toothed; their lobes meeting, or lying over each other, and both their surfaces covered with glandular pustules. The *petals* are pale bluish-coloured, longer and narrower than in *N. Lotus* or *rubra*, several of the outer ones green and furrowed at the back, with green ribs on the upper side.

9. *N. cærulea*. Blue Water-Lily. Dryand in Ait. n. 9. Andr. Repof. t. 197. Curt. Mag. t. 552. Venten. Malmaif. t. 6. (*N. flore cæruleo odoratissimo*; Breyn. Prodr. fasc. 2. 86.)—Leaves somewhat peltate, very slightly and bluntly toothed, smooth and even on both sides. Rays of the *stigma* very numerous, inflexed.—Native of Egypt, from whence we have a specimen, gathered by Dr. Delile, and of the Cape of Good Hope, from which country it was sent to Kew, in 1792. This elegant species is now not uncommon in stoves or greenhouses, where it blooms from May to September, being easily kept in a tub, without being plunged into the bark-bed. The *leaves* are very smooth and even, elliptical in their outline, their lobes somewhat pointed, their margin more or less wavy, or bluntly crenate, scarcely toothed. The large and beautiful blue *flowers* are delightfully fragrant; their *stamens* and *pistil* yellow. *Petals* in three rows, about twenty, and rays of the *stigma* as many.

10. *N. stellata*. Star-flowered Water-Lily. Willd. n. 5. Ait. n. 10. Andr. Repof. t. 330. (*N. malabarica*; Lamarck Dict. v. 4. 457. Citambel; Rheede Hort. Malab.

v. 11. 53. t. 27.)—Leaves somewhat peltate, entire, smooth and even on both sides. Rays of the stigma about ten, spreading.—Native of the East Indies. Sonnerat found it in the island of Mauritius. Mr. W. Anderson raised this, in 1803, from seeds sent to Mr. Lambert by Dr. Roxburgh, and the plants blossomed the same summer. The whole plant is much smaller than *N. carulea*, and requires more heat. The leaves are entire, or slightly waved, purple beneath, with rather divaricated lobes. Petals blue, scarcely more than ten, all in a simple row. Rays of the stigma as many, spreading, broad and short. Poiret in Lamarck says a decoction of the flowers, with sugar, is used to allay coughs, and stop vomiting.

NYMPHÆA, in *Gardening*, comprises plants of the herbaceous flowery aquatic kind, of which the species are; the yellow water-lily (*N. lutea*); the white water-lily (*N. alba*); the Egyptian water-lily (*N. lotus*); and the peltated water-lily (*N. nelumbo*). See the preceding article.

In the second sort, it is remarked by Linnæus, that the flower raises itself out of the water, and expands about seven o'clock in the morning, and closes again, reposing upon the surface, about four in the evening.

From the third species a bread was formerly made of the seed when dried and ground.

And in the fourth kind the Chinese have the roots not only served in summer with ice, but laid up in salt and vinegar for winter: the feeds are somewhat of the size and form of an acorn, and of a taste more delicate than that of almonds; the ponds in China are generally covered with it, and exhibit a very beautiful appearance when it is in flower; and the flowers no less fragrant than handsome.

Method of Culture.—The two first sorts of these plants may be best increased by procuring some of their seed-vessels, just as they become ripe and ready to open, and throwing them into canals, ponds, ditches, or other standing waters, where the seeds, sinking to the bottoms, afford plants in the following spring, floating upon the surface of the waters. And when they have been once fixed to the place this way, they multiply greatly, so as to cover such places in a short time. They are also capable of being cultivated in large troughs or cisterns of water, having earth at the bottoms, flourishing very well, and producing annually large quantities of flowers.

But the third and fourth species, as being tender, should be kept in such troughs or cisterns, and be set in a corner of the stove. In their native situations they are increased both by their roots and seeds as the common sorts in this climate.

NYMPHÆUM, in *Ancient Geography*, a town of the Tauric Chersonesus, which had a good port on the Euxine sea, and lay on the route from Theodosia to Panticapæa.

NYMPHÆUM Promontorium, the name given by Ptolemy to the promontory of mount Athos.

NYMPHÆUS, a port on the western coast of the island of Sardinia, between the promontory Hermæus and the town of Tilius, according to Ptolemy.—Also, a river of Asia, in Armenia, which, according to Procopius, formed a separation between the Roman and Persian empires. It ran from N. to S., entered the town of Martyropolis, and discharged itself into the Tigris, S.E. of Amida.

NYMPHAGOGI, *Νυμφαγωγοί*, among the *Ancients*, an appellation given to those who led the bride from her father's house to that of the bridegroom.

NYMPHARENA, in *Natural History*, the name of a stone found in the beds of some rivers, and having the appearance of a sea-horse's tooth. Doubtless it was a petrified tooth of that or some other such animal, such things being

often found now, though in those early ages they were little known or regarded.

NYMPHARIUM, in *Botany*, a name given by the Greek writers of the later ages to the water-lily.

NYMPHARUM OCULI, in *Natural History*, a name given by some of the ancient writers to a stone we call oculus beli, and sometimes to the operculum of a shell-fish, common on the sea-shores in many places, and called umbilicus Veneris. We are told of Caligula, that he carried his soldiers armed to the sea-side, to pick up the nympharum oculi, and shells. It is certain, in this place, the word only means umbilicus Veneris, for the other oculi nympharum are found only on the shores and in the beds of some particular rivers, not on the sea-shores, among shells.

NYMPHEA, in *Geography*, a small island in the Mediterranean, near the N. coast of the island of Sardinia; 13 miles W. from the island of Rossa.

NYMPHEUM, *Νυμφæιον*, derived from *νυμφη*, bride, among the *Ancients*, a public hall, or building, magnificently adorned and disposed for banquetting and entertainment; where those, who wanted conveniences at home, held their marriage-feasts, &c.

Some authors rather take the ancient nympheum to have been a grotto adorned with statues, jets, and other ornaments; and that it had its name by corruption, from *lymphæum*, of *lympa*, water. In which sense it must have been a public bath.

NYMPHOIDES, in *Botany*, or rather, as it ought to have been, *Nymphæoides*, a name given by Tournefort, to a genus which Linnæus united with *MENYANTHES*; see that article. It alludes to the likeness of the plants in question to *Nymphæa*, in habit at least, though not at all in fructification.

NYMPHOMANIA, in *Medicine*, by many writers termed *Furor uterinus*, a rare species of disease in women, characterised by an uncontrollable desire for venereal intercourse. It is similar to the satyriasis of men. It is sometimes connected with a morbid condition of the uterus or the vagina, especially with a prurigo of the latter; and sometimes it is a mere insanity. In a work of this nature, however, it appears to be unnecessary to enter into a minute detail upon such a subject. Sauvages has followed Sennertus, and described four species of the disease, namely, 1. *Nymphomania salacitas*; 2. *N. furibunda*; 3. *N. fervor uteri*; and 4. *N. pruriginosa*. See his Nosol. Method. Class viii. Ord. ii. Gen. 14.

NYMPHOTOMIA, (from *νυμφη* and *τεμνω*, *seco*). In warm countries, the nymphæ are particularly subject to a morbid enlargement, in such a degree as to prove troublesome and inconvenient, and to require the performance of an operation for the removal of the redundant parts. It is to this proceeding that the ancients have applied the term nymphotomia. In this country, surgeons occasionally meet with instances, in which the nymphæ are considerably increased in size, and it becomes necessary to remove a portion of them.

NYO, in *Geography*, a town of New Mexico, in the province of Cinaloa; 10 miles S.W. of Cinaloa.

NYONS, a town of France, and principal place of a district, in the department of the Drôme; 21 miles S.E. of Montelimart. The place contains 2724, and the canton 10,145 inhabitants, on a territory of 220 kilometres, in 16 communes. N. lat. 44° 2'. E. long. 5° 13'.

NYORDBYE, a small island of Denmark, near the N. coast of Moen, E. of Zealand. N. lat. 55° 3'. E. long. 12° 13'.

NYQUAM,

NYQUAM, a town of Sweden, in the province of Up-land; 10 miles E. of Wasteges.

NYSA, in *Ancient Geography*. See SCYTHOPOLIS.—Also, a town of Thrace, situated between the rivers Mestus and Strymon, in that part of Thrace called Pæonia, afterwards united to Macedonia.—Also, a town of the island of Naxos.—Also, a town of Asia Minor, in Caria, situated near the Meander.—Also, a town of Cappadocia, in the route from Ancyra to Cæsarea, between Parnassus and Osiána.—Also, a town of Arabia Felix, on the confines of Egypt.—Also, a town of Bæotia, on mount Helicon.—Also, a town of India, between the rivers Cophenes and Indus. By Mela and Pliny it is written Nessá.—Also, a town of Lybia.—Also, a town of Egypt.—Also, a town of Eubœa.

NYSAIS, or NYSÆA *Regio*, a country of Asia Minor, between Caria and Phrygia, beyond the Meander.

NYSAND, in *Geography*, a town of Sweden, in the province of Warmeland; 18 miles S.S.E. of Christiania.

NYSATRA, a town of Sweden, in West Bothnia; 32 miles N.N.E. of Umea.

NYSLÖT, a town of Russia, in the government of Viborg, on the lake Saima. Its castle stands on a rock in a river near the town, and is well fortified both by art and nature; 50 miles N.W. of Viborg.

NYSSA, in *Botany*, was so called by Linnæus, because, as he says in the *Hortus Cliffortianus*, "it grows in the waters." In his *Philosophia* he mentions the name as that of a nymph. Hence professor Martyn gives it as the appellation of a water-nymph; but we have sought in vain for any such personage in poetic story. We are equally ignorant of the meaning of the American name, Tupelo tree.—Linn. Gen. 551. Schreb. 737. Mart. Mill. Dict. v. 3. Ait. Hort. Kew. ed. 1. v. 3. 446. Juss. 75.—Class and order, *Polygamia Dioecia*, Linn. rather *Decandria Monogynia*. Nat. Ord. *Holeraceæ*, Linn. *Elæagni*, Juss.

Gen. Ch. *Cal.* Perianth superior, five-cleft, spreading, with a flat base. *Cor.* none. *Stam.* Filaments ten or five, awl-shaped, erect, shorter than the calyx; anthers two-lobed, the length of the filaments. *Pist.* Germen inferior, ovate; style awl-shaped, curved inwards, longer than the stamens; stigma acute. *Peric.* Drupa roundish. *Seed.* Nut elliptical, acute, angular, somewhat irregular, longitudinally grooved.

Eff. Ch. Calyx five-cleft. Corolla none. Stamens ten or five. Drupa roundish, inferior.

Obf. Some flowers have small and abortive anthers.

1. *N. integrifolia*. Mountain Tupelo. Ait. Hort. Kew. ed. 1. v. 3. 446. (*N. aquatica*; Linn. Sp. Pl. 1511, excluding the first synonym of Catesby, but retaining his v. 1. t. 41.)—Leaves entire. Nut roundish, striated. Native of North America, and cultivated, in 1750, by the duke of Argyle.—This tree rises to the height of thirty or forty feet, and is furnished with many, horizontal, depending branches. Leaves obovate, somewhat pointed, dark green and shining above, lighter and hairy underneath. Flowers in axillary clusters, small. Drupas dark purple, about the size of a small cherry. The timber of this tree is said to be hard and close-grained, so as to be much in request with wheel-wrights and other such artificers.

2. *N. denticulata*. Water Tupelo. Ait. Hort. Kew. ed. 1. v. 3. 446. (*Arbor in aquâ nascens, foliis latis acuminate et dentatis, fructu Elæagni majore*; Catesb. Car. v. 1. 60. t. 60.)—Leaves remotely toothed. Nuts oblong, grooved, somewhat wrinkled.—Native also of North America, in wet swamps or near large rivers, and introduced

into this country in 1735, by Mr. Peter Collinson.—This tree is from eighty to an hundred feet high, and much branched towards its summit. Leaves rather large, oval or spear-shaped, slightly toothed, downy beneath; their footstalks long and slender. Drupa in shape and size like small olives, indeed they are preferred by the French inhabitants of the Mississippi like that fruit. The timber is light and compact.

Professor Martyn tells us that Marshall, in his American Grove, adds a third species from Bartram's catalogue, which he calls *Nyssa Ogeche*. This is described as a tree of great singularity and beauty, rising to the height of thirty feet, whose fruit is of a deep scarlet colour, and the size of a Damascene plum. It has an agreeable acid taste, whence it is called the Lime-tree.

NYSSA, in *Gardening*, a plant of the aquatic ornamental tree kind, of which the species are; the mountain tupelo (*N. integrifolia*); and the water tupelo (*N. denticulata*).

Method of Culture.—These trees may be increased by sowing the seeds procured from the places where they grow naturally, putting them into the ground as soon as they are procured, as they lie long before they vegetate. They should be sown in pots filled with light loamy earth, placing them where they may have only the morning sun; and during the first summer the pots should be kept clean from weeds, being well watered in dry weather. The pots should be plunged into the ground in the following autumn; and, if the winter prove severe, cover them with old tan, peas-haulm, or other similar light covering. And in the following spring they should be plunged into a moderate hot-bed, hooped and covered over with mats; keeping the earth constantly moist. By this means the plants are brought up in the spring, when they should be gradually hardened to bear the open air; and during the following summer, the pots again plunged into an eastern border, watering them in dry weather, carefully removing them into a frame in the autumn, where they may be screened from frost; but in mild weather be exposed to the open air. In the spring following, before they begin to shoot, they should be parted carefully, planting each in a small pot filled with loamy mould; and when they are plunged into a moderate hot-bed, it will promote their putting out new roots; after which they may be plunged in an eastern border, and be sheltered again in winter, under a frame. In the third spring, such plants as have made the greatest progress may be planted out in a loamy soil, in a sheltered situation, where they may be capable of enduring the cold of this climate. They make the greatest progress where the soil is inclined to be moist.

And they may likewise be propagated by layers and cuttings, planted out in the autumn or spring in the usual manner.

These plants afford ornament and variety in the shrubbery and other parts, where the ground is of a moist quality.

NYSSANTHES, in *Botany*, received that appellation from Mr. R. Brown, in allusion to the spinous nature of the calyx-leaves and bractæas, the chief characteristic distinction between this genus and *Achyranthes*; the word being derived from *νύσσω*, to prick, or wound, and *άνθος*, a flower. Brown. Prodr. Nov. Holl. v. 1. 418.—Class and order, *Tetrandria Monogynia*. Nat. Ord. *Amaranthi*, or *Amaranthaceæ*, Juss. Brown

Eff. Ch. Calyx in four deep segments; the two outer ones unequal, hardening into spires. Stamens two or four, combined at the base, with intermediate scales. Anthers of two

two cells. Stigma capitate. Capsule membranous, not bursting. Seed solitary.

The *stem* in this genus is either herbaceous or somewhat shrubby. *Leaves* opposite. *Spikes* densely clustered, axillary and terminal. The four-cleft and irregular, as well as spinous, *perianth* distinguishes *Nyssanthus* from *Achyranthes*, to which it is otherwise nearly allied.

1. *N. erecta*.—Stamens four. Segments of the calyx downy, five-ribbed; the awn of the lower one scarcely so long as itself. Leaves oblong-lanceolate, acute; with a very short weakish point. Stem erect.—Gathered by the author, near Port Jackson, New South Wales.

2. *N. media*.—Stamens two. Segments of the calyx downy, three-ribbed; the awn of the lower one longer than itself. Leaves oval-oblong, bluntish; with a pungent point. From the same country.

3. *N. diffusa*.—Stamens two. Segments of the calyx smooth, five-ribbed; awns longer than themselves. Leaves

of the branches oval-oblong; with a pungent point. Stem diffuse.—Gathered by Mr. Brown in the tropical part of New Holland. The *leaves* are scarcely half an inch long.

NYSTADT, in *Geography*, a sea-port town of Sweden, pleasantly situated on the coast of the gulf of Bothnia, in Finland. Its harbour is commodious, and it has a considerable trade in all kinds of wooden vessels; 32 miles N.W. of Abo. N. lat. $61^{\circ} 5'$. E. long. $21^{\circ} 20'$.

NYSTED, or NYESTED, a large but not flourishing town of Denmark, in the island of Laland. Its extent has been much reduced by fire. Its trade to the duchy of Mecklenburg and other provinces of Germany is considerable. In this town are the remains of a stately monastery, built in 1286; 19 miles S.E. of Naskow. N. lat. $54^{\circ} 48'$. E. long. $11^{\circ} 45'$.

NYWICHWANNAK, a river of America, being one of the branches of the Piscataqua.

O.

O

O

O The fourteenth letter of the alphabet; and the fourth vowel.

The grammarians call it a close vowel; because pronounced with the mouth shut.

Among the Latins, the O bore so great an affinity to the U, that they frequently confounded them; writing *consol*, and pronouncing *conful*. See Gruter's Inscript.

Thus, also, they wrote *æquom* for *æquum*, *aorelius* for *aurelius*, *compasuos*, *duomvir*, &c.

The Greeks had two O's; viz. omicron, o, and omega, ω; the first pronounced with the tip of the lips with a sharper sound; the second in the middle of the mouth, with a fuller sound, equal to oo in our language. The long and short pronunciation of our O are equivalent to the two Greek ones; the first as in suppose; the second, as in obey.

O is usually denoted long by a fervile *a* subjoined, as *moan*; or by *e* at the end of the syllable, as *bone*; when these vowels are not used, it is generally short.

O, among the *Ancients*, was a numerical letter signifying eleven; as in the verse,

"O numerum gestat, qui nunc undecimus extat."

When a dash was added at the top, as \bar{O} , it signified eleven thousand.

Among the Irish, the letter O, at the beginning of the name of a family, is a character of dignity, annexed to great houses. Thus, in the history of Ireland, we frequently meet with the *O Neals*, *O Carrols*, &c. considerable houses in that island.

Camden observes, that it is the custom of the lords of

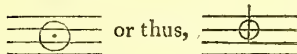
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Ireland to prefix an O to their names, to distinguish them from the commonalty.

A majuscule O, in *Musick*, is a note of time, called by us *semibreve*, by the Italians, *circolo*, making what they call *tempo perfetto*.

The ancients used O as a mark of triple time; from a notion that the ternary, or number three, was the most perfect of numbers, and therefore properly expressed by a circle, the most perfect of figures.

It is not, strictly speaking, the letter O, but the figure of a circle \bigcirc , or double CO, by which the modern ancients in music used to express what they call *tempo perfetto*, or triple time. Hence the Italians call it *circolo*. This circle was sometimes pointed, and sometimes barred thus,



But these equally signified a triple time. Broffard.

The seven antiphones, or alternate hymns of seven verses, &c. sung by the choir in the time of Advent, were formerly called O, from their beginning with such an exclamation.

In the statutes of St. Paul's church in London, there is one chapter, De Faciendo O. Lib. Stat. MSS. f. 86.

O is an adverb of calling, or interjection of sorrow or wishing.

O. NI., in the *Exchequer*. As soon as the sheriff enters into, and makes up his accounts for issues, amerciaments, and mean profits; the practice is to mark on his head *O. ni.* which signifies, *Oneratur, nisi habeat sufficientem exonerationem*: and immediately he becomes the king's debtor, and a debet

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is fet on his head.—Upon which the parties become debtors to the sheriff, and are discharged to the king.

OACCO, in *Geography*, a town of Africa, in the kingdom of Benguela; the capital of a province of the same name, bordering on Malemba.

OACHATE, a harbour at the fourth point of the island of Ulitea. S. lat. $16^{\circ} 55'$. W. long. $151^{\circ} 24'$.

OAHAHA, a river of America, in Louisiana, which discharges itself into the Mississippi, in N. lat. $39^{\circ} 10'$, 7 miles N. of Riviere au Beuf.

OAHOONA, the northernmost of the cluster of islands called Ingraham isles; about two leagues N.E. of Noohoeva; called Washington by Capt. Ingraham, and Massachusettis by Capt. Roberts.

OAITIPIHA, or AITIPIHA Bay, a bay near the N.E. end of the lesser peninsula of the island of Otaheite, with good anchorage in twelve fathoms. S. lat. $17^{\circ} 46' 28''$. W. long. $149^{\circ} 13' 24''$.

OAK, in *Botany*, &c. See QUERCUS.

OAK of Jerusalem. See CHENOPodium.

OAK-Tree, in *Agriculture and Planting*, the general name of a well-known hard-wooded forest-tree, much cultivated for the purpose of timber; particularly in ship-building, and in other cases where much exposure to the weather is required.

It has many species, but that which is of most importance as a timber-tree is the English oak, which grows to a great stature, and lives to a very great age; and which is described as being from sixty to a hundred feet in height, with a very large trunk, a very spreading head, oblong leaves, broadest towards the top, the edges acutely sinuated with obtuse angles.

It has been stated by Mr. Marshall, that "the root of the oak strikes deep, especially the middle or tap-root, which has been traced to a depth nearly equal to the height of the tree itself; nor do the lateral roots run so shallow and horizontal as those of the ash and other trees; but perhaps the roots of very few trees range wider than those of the oak. The stem of the oak is naturally short, and if left to itself, in an open situation, it will generally feather to the ground. It has not that upright tendency as the ash, the esculus, or the pine-tribe: nevertheless, by judicious pruning, or by planting in close order, the oak will acquire a great length of stem; in this case, however, it rarely swells to any considerable girth."

And farther, that "the English oak admits of some varieties: indeed, if we attend minutely to particulars, we shall find them almost infinite. There is one variegation under the name of the stripe-leaved oak: but the most interesting variety of the English oak is the Lucombe, or Devonshire oak. In the sixty-second volume of the Philosophical Transactions, a particular account is given of this oak; setting forth that Mr. Lucombe, a nurseryman near Exeter, having, about the year 1765, sowed a parcel of acorns saved from a tree of his own growth, and observing that one of the seedling plants preserved its leaves through the winter, he paid particular attention to it, and propagated, by grafting, some thousands from it. Its being a sub-evergreen is not the only peculiarity of this variety; it has a somewhat more upright tendency, and seems to be of a quicker growth than oaks in general. The plants, however, which he has seen, do not answer altogether the description given in the account above-mentioned.

The Willow-leaved Oak likewise grows to be a large timber-tree. It receives its name from its leaves resembling very

much those of the common willow. These long narrow leaves have their surface smooth, and their edges entire; their acorns being almost covered with their large cups. And it has several varieties; some having shorter leaves, others broader, and hollowed on the sides; some large acorns, others smaller, &c. all of which are included under the appellation of willow-leaved oaks.

The Chestnut-leaved Oak also grows to be a large timber-tree, and in North America, where it grows naturally, the wood is of great service to the inhabitants. It is so called because the leaves greatly resemble those of the Spanish chestnut-tree. They are about the same size, smooth, and of a fine green colour.

There are likewise two or three varieties of it; but the leaves of all of them prove that they are of the species called the chestnut-leaved oak; so that nothing more need be observed, than that the leaves of some sorts are larger than those of others; that the acorns also differ in size, and grow like those of our English oak, on long or short footstalks, as it may happen in particular cases.

The Black Oak is a tree of lower growth, seldom rising to more than thirty feet in height. The bark of this tree is of a very dark colour, which occasioned its being named the black oak. The leaves are smooth, very large, narrow at their base, but broad at their top, being in shape like a wedge: they have indentures at the top, so as to occasion its having an angular look; they are of a shining green colour, and grow on short footstalks on the branches.

And there are varieties of it, particularly with trifid leaves, and slightly trilobate, called the black oak of the plains, the leaves and cups of all which are small.

The Red Virginia Oak grows to be a timber tree of sixty or seventy feet high, and the branches are covered with a very dark coloured bark. It is called the red oak, from the colour of its leaves, which in the autumn decline to a deep red colour.

It has several varieties, the leaves of which differ in size and figure; but those of the larger sort are finely veined, and exceedingly large, being often found ten inches long, and five or six broad. They are obtusely sinuated, having angles, and are of a fine green colour in the first part of the summer, but afterwards change by degrees to red, which marks these trees to be of this sort. There are also several subvarieties of it, which exhibit a manifest difference in the size of the leaves, acorns, and cups. That is the best which is commonly called the Virginian scarlet oak; and the bark is preferred for the tanners' use before that of all the other sorts.

The White Oak does not grow to the size of the former, seldom being found higher than forty feet, even in Virginia, where it grows naturally. But though the timber is not so large, yet it is more durable, and consequently of greater value for building to the inhabitants of America, than any of the other sorts. The branches of this tree are covered with a whitish bark; the leaves also are of a light colour. They are pretty large, being about six inches long, and four broad: they have several obtuse sinuses and angles, and are placed on short footstalks.

This has a variety or two, and the acorns are like those of our common oak.

The Italian Oak grows to about the height of thirty feet; the branches are covered with a dark purplish bark. The leaves are smooth, and so deeply sinuated as to have some resemblance of pinnated leaves; and each has a very short footstalk. The fruit of this species sits close to the branches. The cups are in some degree prickly and rough, and each contains a long slender acorn, that is eatable. In the places where

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where these trees grow naturally, the acorns are, in times of scarcity, ground into flour, and made into bread.

The *Spanish Oak* grows to be as large a tree as our common oak, and is in no way inferior to it in stateliness and grandeur; for the branches will be far extended all around, causing, with the leaves, a delightful shade. Though the bark of these branches is of a whitish colour, yet they are nevertheless spotted with brownish spots. The leaves are of an oblong-oval figure, but not very long, seldom being longer than three inches, and two broad. They are smooth, and have their edges deeply serrated: these serratures are acute, and chiefly turn backwards. Their upper surface is of a fine light green colour, and their under of an hoary cast; and with these beautiful leaves each branch is plentifully ornamented all over the tree. The cups are most peculiar and singular; for they are very large, and composed of several rough, black, large scales, that lap over one another like the scales of a fish. They almost cover the acorn, though they are pretty large, narrow at the bottom, but broader higher, and have their top flat. The acorns are used in dyeing.

The *Austrian Oak* is of lower growth than the preceding species, seldom rising more than forty feet high. The leaves are of two colours; their upper surface being of a fine green colour, and their under downy. Their figure is oblong; but they are so indented about the middle, as to make them have the resemblance of a lyre. They are wing-pointed, transversely jagged, and stand on slender footstalks on the branches. The cups of this sort also are smaller and prickly, and the acorns proportionally smaller than those of the preceding part.

It may be noticed, that there are some other sorts mentioned by writers on rural economy; but they are not of much consequence to the planter or timber dealer.

Manner of raising the Plants.—These, in all the sorts of oaks, are raised from the seeds or acorns, which should be sown as soon as possible after they are ripe; for if they are kept too long out of the ground, they seldom grow at all.

And the manner of sowing the acorns, if designed for a small plantation, or to be removed, is to prepare some beds of fresh earth, neither too strong and heavy nor too light and dry. In these beds the acorns should be placed in rows one foot asunder, and about two inches distance in the rows, covering them about two inches thick with the same fresh earth. In the spring, when the plants begin to appear, they must be carefully cleared from weeds; and if the season proves dry, refreshed now and then with a little water, which greatly promotes their growth. In these beds the plants should remain until the following autumn, observing constantly to keep them clear from weeds; at which time, a spot of good fresh earth, in size proportionable to the quantity of the plants, should be trenched and levelled for preserving them: then towards the middle or latter end of October, the plants should be carefully taken up, so as not to injure their roots, and be planted out in rows three feet asunder, and eighteen inches distance plant from plant; observing never to suffer the plants to abide long out of the ground before they are planted, as their roots would dry, and endanger their growth. And when they are planted, a little littery dung should be laid upon the surface of the ground, near the roots, to prevent the earth from drying too fast; and if the season should prove very dry, little water should be given to settle the earth to their roots.

As soon as the plants have taken root, they will require little more care than to keep them clear from weeds, and dig the ground between the rows every spring; in doing of which, such roots as extend very far from the trunk of the

trees should be cut off, which will render them better for transplanting again: also prune off such side-branches as extend themselves very far, and would retard the upright shoot; but not by any means all the small lateral branches, some of which are absolutely necessary to be left in, to detain the sap for the augmentation of the trunk: for, where trees have been thus closely pruned, their heads have overgrown their bodies, so that they have bent downward, and become crooked.

After these trees have remained in the nursery three or four years, they will be large enough to transplant to the places where they are to remain: for it is not proper to let them grow very large before they are planted out, as they are very hazardous trees to remove when old, or after they have taken deep root.

The best season for this work is in the autumn; at which time, if they are carefully taken up, there will be little danger of their succeeding. When they are planted, the surface of the ground should be littered about their roots, to prevent its drying too fast; and if the season is very dry, they should be watered, to settle the earth to their roots, which may be repeated two or three times in very dry weather: but carefully avoid giving them too much water, which is very injurious to these trees, when newly removed. They should also be staked, to prevent their being shaken and disturbed by the winds, which would retard their rooting. In transplanting of the trees, by no means cut their heads, which is too much practised: all that should be done is to cut off any bruised or ill-placed branches, which should be taken off close to the place where they are produced. But there can be no greater injury done to these trees than to shorten their shoots; for when the leading bud, which is absolutely necessary to draw and attract the nourishment, is taken off, the branch often decays entirely, or, at least, down to the next vigorous bud. The trees, thus raised and managed, when planted in a proper soil, grow to a considerable magnitude, and are very proper for a wilderness in large gardens, or to plant in clumps in parks, &c. The directions here given are, however, designed only for small plantations, in places which are only for pleasure.

Raising Oaks for Timber.—In cases where these trees are cultivated with a view to profit in timber, the acorns should be sown where the trees are designed to grow: in order to which, provide in autumn a sufficient quantity of acorns, which should be always taken from straight, upright, vigorous growing trees. These should be gathered from under the trees as soon as may be after they are fallen, and, if possible, in a dry time; laying them thin in some open room to dry. Those which are transplanted will never grow to the size of those which stand where they are sown, nor will they last near so long sound: for in some places, where these trees have been transplanted with the greatest care, and have grown very fast for several years after, they are now decaying; while those which remained in the places where they came up from the acorns are still very thriving, and have not the least sign of decay: therefore, whoever designs to cultivate these trees for timber, should never think of transplanting them, but sow the acorns on the same ground where they are to grow; for the timber of all those trees which are transplanted is not near so valuable as that of the trees from acorns. In this business, the first thing to be done is that of fencing the ground very well, in order to keep out cattle, hares, and rabbits; for if these animals can get into the ground, they soon destroy all the young trees. In a few years, the trees grow to be out of danger from the hares and rabbits; but it will be many years before they be past injury from the cattle, if they are permitted to get into

the plantation: therefore, durable fences should be put round the ground. If, in the beginning, a pale fence is made about the land, close at the bottom, and open above, and within it a quick hedge planted, the latter will become a good fence, by the time the paling decays, against all sorts of cattle; and when the trees will have got above the reach of hares and rabbits, so that they cannot injure them.

As soon as the ground has been well fenced in, it should be prepared by ploughing it three or four times; and after each ploughing, harrowing it well to break the clods, and cleanse the ground from couch, and the roots of all bad weeds. If the ground is broken up from the green sward, it will be better to have one crop of beans, pease, or turnips, off the ground, before the acorns are sown, provided these crops are well hoed, to stir the surface, and destroy the weeds. If this is properly done, the crop will improve the land for sowing; but in this case, the ground should be ploughed as soon as possible after the crop is taken off, the acorns being sown as soon as they can after they are ripe: for although they may be preserved in sand for some time, they will be apt to sprout, by which the shoots are in danger of being broken and spoiled. And in making choice of acorns, those should be preferred which are taken from the largest and most thriving trees; but those of pollard trees always rejected, though the latter are generally the most productive of acorns. Those obtained from the large trees commonly produce the strongest and most thriving plants.

Sowing the Acorns.—The ground having been thus ploughed, levelled, and brought into order, the acorns should be sown in drills made across the ground, at about four feet asunder, and two inches deep; being scattered in at two inches distance. These drills may be drawn either with a drill-plough, or by hand, with an hoe; but the former is the most expeditious method; therefore, in large plantations, should be preferred. In the drawing of the drills, if the land has any slope to one side, these should be made the same way as the ground slopes, that there may be no stoppage of the wet by the rows of the plants crossing the hanging of the land. This should be particularly observed in all wet ground, or where the wet is subject to lie in winter. When the acorns are sown, the drills should be carefully filled in, so as to cover the acorns securely; for if any of them are exposed, they will entice the birds and mice; and if either of these once attack them, they will make great havock and destruction. The reason for directing the drills to be made at this distance, is for the more convenient stirring of the ground between the rows, to keep the young plants clean from weeds; as, if this is not carefully done, it cannot be expected that the young plants should make much progress; and yet this is generally neglected by many who pretend to be great planters, who are often at a large expence to plant, but seldom regard them after; so that the young plants have the difficulty to encounter the weeds, which frequently are four or five times the height of the plants, and not only shade and draw them, but also exhaust all the goodness of the ground, and consequently starve the plants; therefore, whoever hopes to have success in their plantations of this sort, should determine to be at the expence of keeping them clean for eight or ten years after sowing, by which time the plants will have obtained strength enough to keep down the weeds; the neglecting of this has occasioned many young plantations to miscarry. About the end of March, or beginning of April, the young plants will appear above ground; but before this, if the ground should produce many young weeds, it will be good husbandry to scuffle the surface over with Dutch hoes, in a dry time, either the latter end of March, or the begin-

ning of April, to destroy the weeds, whereby the ground will be kept clean, until all the plants are come up so far as to be plainly discerned; by which time it may be proper to hoe the ground over again; for by doing it early, while the weeds are small, a man will perform more of this work in one day than he can in three or four when they are grown large; besides, there will be great hazard of cutting off or injuring the young plants, when they are hid by the weeds; and small weeds, being cut, are soon dried up by the sun, but large weeds often take fresh root, and grow again, especially if rain should fall soon after, and then they will grow faster for being stirred; therefore it is not only the best method, but also the cheapest husbandry to begin cleaning early in the spring, and to repeat it as often as the weeds are produced. In the first summer, while the plants are young, it will be the best way to perform these hoeings by hand; but afterwards it may be done with the hoe-plough; for as the rows are four feet asunder, there will be room enough for this plough to work; and as this will stir and loosen the ground, it will be of great service to the plants; but there will require little hand labour where the plough is used, in order to destroy the weeds, which will come up in the rows between the plants; for these will be out of reach of the plough, and, if they are not destroyed, they will soon overgrow and injure the young plants.

As soon as the plants have had two years' growth, it will be proper to draw out some of them, where they are too close; in doing which, great care should be had not to injure the roots of those that are left; for as the plants which are drawn out are only fit for plantations designed for pleasure, so these should not be so much regarded in their being moved, as to sacrifice any of those which are designed to remain. In these thinnings the plants at first should be left about one foot asunder, which gives them room enough to grow two or three years longer; by which time it may be easy to judge which are likely to make the best trees. These may be then fixed on, as standards, to remain; though it will be proper to have a greater number at this time marked than can be permitted to grow, because some of them may not answer the expectation; and, as it will be improper to thin these trees too much at one time, so the leaving double the number intended at the second thinning will not be amiss. If they are left at about four feet distance in the rows, they will have room enough to grow three or four years longer; by which time, if the plants have made good progress, their roots will have spread over the ground, when it will be proper to take up every other tree in the rows. But, by this, it is not meant to be exact in the removing, but to make choice of the best plants to stand, whichever rows they may be in, or if they should not be exactly at the distance here assigned. When the plants have been reduced to the distance of about eight feet, they will not require any more thinning: But in two or three years time, those which are not to remain will be fit to cut down, to make stools for underwood, and those which are to remain, will have made such progress as to become a shelter to each other; for this is what should principally be attended to, whenever the trees are thinned; therefore, in all such places which are much exposed to the wind, the trees should be thinned with great caution, and by slow degrees; for if the air is let too much at once into the plantation, it will give a sudden check to the trees, and greatly retard their growth; but, in sheltered situations, there need not be so great caution used as in those places; the plants will not be in so much danger of suffering from exposure to the cold winds.

The proper distance which should be allowed to those trees which are designed to remain for timber, is from twenty-

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twenty-five to thirty feet, or more, which will not be too near, where the trees thrive well; in which case their heads will spread, so as to meet in about thirty, or thirty-five years; nor will this distance be too great, so as to impede the upright growth of the trees. This distance is intended that the trees should enjoy the whole benefit of the soil.

And after one crop of the underwood, or, at the most, two are cut, the stubbing up the stools is advised, that the ground may be entirely clear, for the advantage of the growing timber, which is what should be principally regarded; but, in general, most planters have more regard for the immediate profit of the underwood than the future good of the timber, and, frequently, by so doing, spoil both; for, if the underwood is left after the trees are spread so far as that their heads meet, the underwood will not be of much worth; and yet by their stools being left, they will draw away a great share of the nourishment from the timber trees, and retard them in their progress very considerably.

Quality of Soil.—The soil in which the oak makes the greatest progress, is usually a deep rich loam, in which the trees grow to the largest size; and the timber of those trees which grow upon this land, is generally more pliable than that which grows on a shallower or drier ground; but the wood of the latter is much more compact and hard. Indeed there are few soils in which the oak will not grow, provided there be proper care taken in their cultivation; though this tree will not thrive equally in all soils; but yet it might be cultivated to a national advantage upon many large wastes in many parts of the kingdom, as also to the great profit of the estates where these tracts of land now lie uncultivated, and produce nothing to the owner; as, should the present practice of destroying this sort of timber continue, and little care be taken to raise a future supply; this country, which has been so long esteemed for its naval strength, may be obliged to seek for timber abroad.

In speaking of the culture of the oak, Mr. Yates has stated that an opinion is generally prevalent, that the oak is particularly slow in its growth, and requires a great number of years before it affords any advantage. This idea too often deters from planting, on account of the very great length of time it is supposed the land must be occupied before any return of valuable produce can be obtained from it, after a considerable expence may have been incurred in forming plantations. But this opinion he considers as entirely founded in error, and to have taken its rise in a great measure from the want of proper management which has hitherto commonly prevailed in the raising of oaks. It is conceived, however, on the ground of experience, that the oak may be rendered very rapid in its growth, and that consequently land may be employed to great advantage in its cultivation, as a very considerable and profitable produce may, in a much shorter time than is generally supposed, be derived from proper parts of an estate thus employed. And that oak-timber in this country, for the most part, appears in trees of a considerable extent of head, but seldom more than twenty or thirty feet in stem; and this, in many instances, the growth of a century. Now, by the course of management here proposed, it is conceived that trees, of at least double this magnitude, may be obtained in about half that time; but it is not his intention to attempt a proof of this proposition by theoretical deductions, but to appeal for its confirmation to the indubitable test of fact, which, from the event of repeated trials, impresses a conviction, that experience will be found to support and establish in the most unequivocal manner. And in proof of this it is stated that the oak, in the progress of its growth, spreads numerous roots near the surface of the ground, and

in an horizontal direction; these assist in supporting and preserving the tree in its position, but seem to contribute very little to its increase and magnitude. The oak appears to derive its chief nutriment and strength from a root that always descends at right angles to the horizon, and is called the tap-root. The first thing, therefore, to be observed, is, that upon a judicious attention to this peculiarity, the planter's success principally depends; and the neglect of this care is the constant source of error and disappointment. In all climates, and upon all soils, to preserve this tap-root from injury, and as much as possible to assist its growth, is, he conceives, a general, and indeed the most essential principle in the cultivation of oak. With a due regard to this circumstance, the management of a plantation may be resolved into the three following practical directions:

1. Previously to planting the acorns, loosen the earth intended for their reception, by deep trenching.
2. Never transplant, or in any way disturb the saplings intended for timber.
3. Keep the plant carefully pruned, till arrived at a proper height.

In order more fully to elucidate the subject, and to prevent the possibility of misapprehension, it may be proper to give a more detailed statement. And that in determining on a spot to form a plantation of oaks for timber, it must always be recollected that the plants are to remain without removal in their first situation: the clearing and fencing may then be attended to as usual; and in the course of the winter, from September to March, the particular spots intended for the reception of acorns, be prepared for that purpose, by digging a trench about three feet in width, and from three to six feet in depth, according to the closeness and tenacity of the soil. If grass ground, the first spit should be placed at the bottom of the trench; and if more than one trench be necessary, they should be prepared in the same manner, preserving a distance of ten yards between each, if it be intended to employ the intermediate space in underwood, or for any other purpose. Then having made a careful selection of acorns that are perfectly sound, and in good preservation, they are to be planted about the middle of March. For this purpose it is advised to draw a drill in the centre of the trench; two inches in depth, if the soil be heavy and loamy; but three inches in a light and sandy earth: and in this case to place the acorns two inches asunder, and cover them carefully with mould. When the plants appear, they must be weeded by hand in the rows, and the earth of the trench round them cleaned with a hoe, once a month during the summer. In October it is supposed necessary to inspect the rows, and thin them by pulling up every other plant: attention will of course be paid to remove the weak and crooked plants, and leave those that are tallest and straightest. In the second year, the operation of thinning must be repeated, at the same time and in the same manner; and, should any of the remaining plants have made side-shoots stronger than the general character, they must be smoothly cut off with a sharp knife, close to the leading stem. In the third year the thinning is again to be repeated, and the general pruning commenced, by cutting off close to the leading stem all the side-shoots of the first year; thus leaving the branches of two years to form the head of the following year. The removal of every alternate plant must be continued yearly, till the trees are about thirty feet apart, at which distance they may remain for timber. The pruning is to be continued, by removing every year, very smooth and close to the main stem, one year's growth of side branches, till the plants are arrived at
a stem

a stem of forty, fifty, or sixty feet, and they may then be permitted to run to head without further pruning. But the particular arrangement here recommended may be varied according to any peculiarities of situation, regard being constantly had to the general and most important principle of loosening the ground very deep previously to planting the acorns. By this mode of culture, oaks may be raised in almost any soil; but, where it is possible, a loam or marle is always to be chosen. Oaks thrive much the best in such earth; and when assisted by deep trenching and judicious pruning, attain in a few years to an immense size. It is added that those who have been accustomed to notice the slow growth and stunted appearance of oak-trees, when denied the assistance of art, and left to themselves in the common way, would observe with astonishment the vigorous and rapid increase of plants under the management here pointed out. And further, that the plants thinned out the first three or four years, though not fit to be depended upon for timber, as transplanting generally injures materially the future growth, may be replanted in the intermediate spaces between the rows, for the purpose of being afterwards removed; or they may be usefully placed in hedges, or other spare and unoccupied spots of ground. They should be headed down at the time of transplanting, as this operation assists the process of nature, in reproducing or remedying any injury the tap-root may have received from the removal; and if proper attention be given to loosening the soil for their reception, and pruning them as they advance, in most instances an adequate profit will be derived from the labour bestowed upon them. After a few years, the produce of the timber plantation will be found very advantageous. The young trees that are to be removed yearly, will always find a ready market for a variety of purposes, unnecessary here to enumerate. And in addition to these advantages by this treatment of deep trenching previous to planting, and annual careful pruning during the growth, timber can be produced in about fifty years of equal quality, and much superior in size to that which has been above one hundred years growing under improper management, or without the assistance of cultivation; it will doubtless be allowed that a most beneficial, if not absolutely the best possible method of raising oaks, is here pointed out and ascertained. But this method of cultivation may perhaps be thought to occasion so much expence in manual labour as to prevent its being generally adopted: it might perhaps be sufficient to observe, that if the work be conducted with judgment and economy, the future produce would afford ample returns for all necessary expenditure: it should also be recollected, that the previous preparation of the ground, and the subsequent pruning of the plants, are both to be performed at that season of the year when a scarcity of work will enable the planter to obtain assistance upon easier terms; with this additional advantage also, of providing employment for the labourer at those times when the general state of agricultural business renders it difficult for him to find maintenance for himself and family without charitable relief.

In support of this practice it is stated, that in 1750, at Ingetrie in Staffordshire, the seat of lord Chetwynd, some plantations were formed and managed in a great measure according to these principles, and the growth of the plants was so uncommonly rapid, and so extraordinary, that it could not but attract the notice of all concerned in the conduct of them.

On the whole it is concluded, from the statements made here, and from what may be seen in every part of the kingdom, in the character and appearance of oaks growing

without cultivation, that it seems ascertained, that acorns set with the spade or dibble, without digging or tillage, can never be depended on to form good timber; and even in the most favourable circumstances of this case, the growth will be exceedingly slow and precarious. The same may be said of young plants, previously raised in nurseries and transplanted; for if the tap-root be cut, broken, or in any degree injured, which in transplanting it is almost impossible to avoid, that plant will seldom become a vigorous and flourishing tree.

Transactions of the Society for the Encouragement of Arts, &c. vol. xx. and the facts recorded by Mr. Majendie in the same Transactions, strongly confirm the propriety of the above principles and practice. It is there stated that he planted five thousand three hundred oaks in two separate inclosures, and that the first plantation, containing four thousand six hundred oaks, was formed on part of the ancient Home Park, surrounding the castle: the soil was dug one full spit, and the turf inverted; the plants were two-years old seedlings, removed with the greatest care from the feed-bed, by undermining the roots; so as to bring them up undamaged and entire in the strictest sense: the sub-soil of the intended plantation being a rich tender loam, holes were bored into it with an iron instrument, used in the country for fixing hop-poles into the earth: into these the trees were planted, using great caution that each seedling should have a hole suitable to the length of its tap-root, which they were careful to set upright, and without doubling it: the tap-roots of these plants were from eighteen to thirty-six inches in length. His motives for planting the trees without shortening their tap-roots, were these: it has long been asserted, that the oak suffers greatly in value from transplanting, and that the timber of such trees is of an inferior quality to that produced by sowing the acorn. These facts were long since well known to Millar and Hanbury. It is further stated, that a common practice in planting oaks, is to sow the acorns in a bed; and, after one or two years to transplant the seedlings into rows in a nursery, where they remain two or three years longer; when the young trees are taken up, and their tap-roots, being previously shortened, are finally planted out. Now by this process, it is plain the tree undergoes two removals before it is finally planted. To avoid this, he determined to plant out his oaks at once from the feed-bed, with an idea that, by their receiving only one check instead of two, and this at so early an age, they would soon recover it, so as in the end to suffer no sort of detriment; more particularly as by preserving their tap-roots entire, the trees were planted as much as possible in a natural state. And that, with some it is not unusual to plant out young oaks immediately from the feed-bed, but they are for the most part *tapped* at the time of removal; or, this operation is previously effected by an instrument introduced beneath the soil that divides the root, whilst the tree is still growing: after which it is suffered to remain in the ground several years before it is finally removed: but in both these instances the intentions of nature in respect to this tree seem to be violated.—Would it not be preferable, upon all occasions of transplanting, with a view to timber, to remove the trees at as early an age as possible, and without any mutilation, from the feed-bed to the soil where they are to grow? By which, if the seminary (as it ever should be) is at no great distance from the land intended to be planted, and that the essential requisite of taking up the trees with the utmost care is attended to, the removal will be hardly, if at all, felt: and, at all events, until the question is decided, whether it is best, in order to procure

OAK-TREE.

procure timber of the first quality, to sow acorns where they are to remain, or to transplant oaks, it is but reasonable that the practice of transplanting (generally considered as inferior to that of sowing) should be conducted with as few deviations from nature as possible.

It is suggested, that at the time of forming this plantation (December 1786), he made the following experiments, with a view to a comparison between young oaks planted with their roots entire, and those whose roots had been *tapped*. On the 5th of that month, he selected from his seedling-oaks twenty-four of the straightest, and which were of an equal length, namely, three feet six inches from the extremity of the tap-root to the top of the plant, the root alone being twenty-seven inches, and the plant fifteen inches in length; twelve of these were planted in the same manner as the rest of the oaks in the enclosure with entire roots, and at the distance of five feet from each other: contiguous to these, and at the same time and distance, the remaining twelve were planted, taking off previously eighteen inches from their tap-roots, so that nine inches only of root remained. And as he wished to observe the progress of these trees, at the expiration of a few years; on the 6th of December 1791, he caused one of each to be carefully dug up, which he found in the manner described below.

But it is not pretended at present to draw any accurate conclusion from this experiment; for indeed it must require long experience, and a course of years, to form decided opinions concerning a tree of such slow growth as the oak. He purposes, however, continuing his remarks upon these trees thus experimentally planted, by digging up others from time to time, in order to observe the comparative progress of their roots. His intention in thus planting these trees, and remarking at various periods the degrees of difference between their growths, was with a view of ascertaining hereafter, whether the planting of perfect oak seedlings, without dividing their tap-roots, might not be the means of insuring better timber than by the usual method of planting those which have been previously *tapped* for admitting the oak, from the unremoving acorn, in all cases, to arrive at a superiority of timber to that of the transplanted tree, at however early an age it is removed: still, as long as the practice of transplanting oaks is in use, it may be presumed that a seedling removed with proper care from the seminary, and planted entire, will prove superior to one whose root has been mutilated; as having sustained in its treatment a less deviation from nature. For that, in the perfect tree, alluded to above, the tap-root has acquired a regularity of thickness in its general growth, and that its lateral shoots are mostly fibrous; because the tree, having remained in possession of its natural source of nourishment, was enabled, soon after being transplanted, to vegetate as before: on the other hand, the mutilated tree has thrown out a number of thick woody horizontal roots near the place where the tap-root was shortened, as if nature, to preserve her produce, had been intent on repairing the damage she had sustained; after which, the root resumes its natural downward tendency, with a regularity that might almost induce an idea that the root had never been at all divided. But, to remove the most distant doubt on this head, others of these trees have been taken up, in which, after the most careful examination, the same distinct modes of growth appear, as in these. It may be farther remarked, that these trees have not succeeded ill with him, when it is considered they have only been planted five years, and were at that time only fifteen inches in height from the ground.

It is stated that, on digging up the trees the following were the

Admeasurements of each:

Oaks planted with an entire Root.

	Feet.	Inches.
Extreme height from the bottom of the tap-root - - - - -	11	2½
Height from the ground - - - - -	7	7
Circumference close to the ground - - - - -	0	6½

Oaks planted with a tapped Root.

	Feet.	Inches.
Extreme height from the bottom of the tap-root - - - - -	10	3
Height from the ground - - - - -	6	9
Circumference close to the ground - - - - -	0	6½

This planter could have selected larger trees from his plantation, but preferred the above for the sake of accuracy, as they were both planted the same day.

And it is stated that the second enclosure, at some considerable distance from the former, and part of the ancient great park of the estate, was planted with seven hundred oaks; and has in all respects received a similar treatment with the first. Both plantations are securely fenced, and in a very flourishing condition, the trees seeming suited to the soil. They have been carefully attended, and judiciously pruned; whereby they have acquired an upright growth, which, together with their being planted tolerably thick, will ensure a length of stem. And it is concluded that, under a continuation of the present treatment, he can have no room to doubt the future success of the plantations. In fact, these different statements clearly demonstrate the great advantage of the method of sowing the acorns in the situations where the trees are to remain, and that where this cannot be done, the next best mode is that of removing the plants when young, with their tap-roots entire. It is obvious likewise, that, where these trees are cultivated on an extensive scale, the land may be well prepared by means of the trenching plough with much less expence and with greater convenience than by manual labour in most cases.

In Mr. Smith's trials in Yorkshire, much advantage has been found from the young oaks having shelter afforded by firs which have obtained a year's growth, as in a plantation made in 1792, and which was last year joined to this, by another piece of land about three acres then taken in. The oaks were there set at the same time as the firs, but on one part were not mixed with them; and in that part they thrived so ill, as to make no progress, until some Scotch firs were planted among them; since which they have assumed a different appearance, and are now growing tolerably well. But another advantage he has observed in planting, arises from having the holes made the year before the plants are put in: by this method the frost ameliorates the soil, and makes it, particularly in bad land, finer, which encourages the fibres of the young plants to shoot more freely. It is noticed that two lands in his plantation were not ploughed; and the reason that induces him to mention the circumstance, is the supposition that the trees would grow best upon the land that was ploughed. In this he has not been disappointed; those that were set upon the two lands not ploughed, having made less shoots than the other; and though they grow tolerably well, yet an evident difference is observable in the luxuriance of their appearance,

pearance, which certainly is an additional proof that ploughing the land, and making the holes the year preceding the planting of trees, is of material consequence in the success of an undertaking of this nature. This is the case, not only with the oaks, but other sorts of timber trees in general.

Mr. Nichol has contended that nothing assists more in the propagation and preservation of timber than thorns and bushes, especially where there are no fences to keep off cattle. Underwood never fails to bring a stock of timber on a favourable soil: and the destruction of bushes in lands not inclosed, will assuredly prevent a succession of timber, by depriving the young plants of their nurseries, and leaving the acorns that are casually dropped exposed to various enemies. The constant cutting, therefore, of underwood by the keepers in forests, under pretence of browse for the deer, is attended with the most mischievous consequences to the growth of timber. The unlimited mowing of fern is also extremely injurious to the growth of timber; for the fern shades the roots, and keeps the young plants moist and cool: and by cutting it up, the young trees are cut up with it as soon as they arise. On this ground, he advises the making plantations without any previous preparation, as being the cheapest, and answering the purpose extremely well. This may be an useful mode in forests, and wastes full of bushes. He has invented a good instrument for introducing and planting acorns among the bushes. But in raising a new wood, it must be much more effectual to prepare and clean the ground well, and to set the acorns in drills, that the young plants may be kept clean by horse-hoeing till they can bid defiance to weeds and other annoyances.

In speaking of the comparison between sown and planted oaks, Mr. Plampin, of Chadacre, in Suffolk, affirms, that the latter are so inferior to the former, as to induce him to give a general condemnation of planting for timber. But Mr. Marshall endeavours to reconcile the dispute about sowing and planting, by observing that where the strength of the lands lies in the substratum, while the surface of the soil is of an ungenial nature, we should sow, in order that the roots may strike deep: but on the contrary, when the top soil is good, and the bottom of an opposite quality, to plant, and thereby give the roots the full enjoyment of the productive part of the soil; or, under these last circumstances, sow, and tap the young plants as they stand, and thereby check their downward tendency, as well as strengthen their horizontal roots. And it has been remarked, that in raising oaks for timber, draining should be well attended to; nothing contributing more to their growth and health, than keeping the land dry, if it is in the least inclinable to be swampy or retentive of moisture.

In the second volume of the Rural Economy of Norfolk, oaks are observed to grow best, and make the finest plants and the most beautiful trees, when they are raised undisturbed from the acorn. The oak having naturally a strong tap-root, it is almost certain death to remove a large plant which has not been transplanted or tapped whilst young: nevertheless, if the tap-root has been properly taken off from the seedling plant, it may afterwards be removed at pleasure, with safety. Oaks may, however, be tapped by taking up the plants and taking off the tap-root with a knife, or it may be done as they stand, with a tapping-iron, or even a common spade ground to an edge. This, being introduced at a proper depth beneath the surface of the ground, cuts off the tap-root; leaving the principal part of the lateral horizontal fibres undisturbed. When the plants have got large (four or five years old for instance),

this is perhaps the safest way of treating them; for the lateral shoots in this case receive no check whatever, but continue to throw up a regular supply of sap to the plant: whereas, by taking them up and removing them into a fresh situation, they are several days before they begin to work; in which time the plant may receive irrecoverable injury.

It is stated, that a feed-bed of oaklings, five years old, was treated in this manner; in March and April the planter tapped them all with common spades, ground sharp; pruned such as were in any degree straight; and headed down the rest near the ground, to throw out shoots to be trained. Not a plant is dead. Had there been more of them cut down the effect would have been still better. And a striking instance of success in transplanting large oaks for standards, occurs on Gunton Common. Scarcely a plant, of some thousands, has miscarried, and there are very few which do not flourish. A person who had some share in the business of this plantation, tells him that it was the employment of two men and a couple of horses, almost all the first summer after they were planted, to water them; not by a pailful, but by a hoghead at once; which served for the summer. This was a rational method; a pailful only tantalises and baulks the plant; whereas a hoghead deposited at its root affords a natural and regular supply, to be drawn up leisurely by the sun during the course of the summer. It is likewise observed, that upon some estates it is the practice to put in, when a new hedge is planted, a holly at every rod, and an oak plant at every two or three rods, among the white-thorn layer. This is an excellent practice, provided the young oaks be trained to a proper height before they be suffered to form their heads. For, in this case they will become a valuable source of timber, without injuring, in any material degree, the inclosures they grow between. They are the roots of the ash and elm, and the tops of low pollards and tall overgrown hedge-woods, which are injurious to the farmer. A timber-oak, of from fifteen to twenty feet stem, does very little, if any, injury either to the crop, or the hedge growing under it. But if, on the contrary, the oaklings thus planted be suffered to rise with more than one stem, as stubwood, or risingly (which is seldom the case in a young hedge), they be permitted to form their heads at eight or ten feet high, with flat wide spreading tops, they lose their intended value, and become nuisances, not only to the adjoining inclosures, but to the hedge in which they grow. Eligible, therefore, as it is to plant young oaks among hedge-wood, the advantage to be obtained from it rests wholly on the after-management which is pursued.

In the Annals of Agriculture, Mr. Young states, that oaks are of slow growth, but if you put them at proper distances amongst the quick growing trees, they will sometimes be drawn up beyond your expectations, and he cautions you to watch them, and to cut out such trees as crowd upon them, by transplanting them every third year into a nursery; they may be put out from six to ten feet high. And that land that will let at from 12s. to 18s. per acre, for any given time, pays better than with wood, if you calculate the compound interest on the annual rent; but who is there that is so careful as to make it, or that can make it, on very small sums? He considers the appropriating of 50 acres out of every thousand, as laying by a small part of the income of an estate, that will not be missed, at compound interest, as an accumulating fund that frequently comes in very seasonable to stop a large gap. And he has now, of his grandfather's sowing, about 26 acres of as fine young oak-timber as can be seen, which may be worth, in 25 or 30 years, 4000l. He has likewise, of his
father's

father's sowing, 20 acres to succeed them. His ancestors have done so much; he has only added about ten acres to the fund, chiefly of Scotch fir, on a poor soil where other trees have been tried, and failed; the thinning of these woods likewise pays a fair rent, after a time. He made a purchase upon which were 14 acres of wood-land; there are 400 oak-trees upon it, that in 30 years, from the time of the purchase, will sell for as much as the estate cost him, 1000*l*.

Thinning of.—It may be noticed, that one of the most essential things to be observed in the management of oak-woods is the judicious thinning of them. When they are thinned so as to be about two feet distant, they may stand twelve or fourteen years, when every second plant may be taken out and sold for hoops or small poles; only observing, that if the ground be good, and the trees take to growing well, they will want thinning sooner. In seven or eight years more, the healthiest trees must be marked for timber, and the others cut down for poles, and the stools left for underwood. In thirty years they will be useful for small scantlings, spars, rafters, battings, rails, props, &c. not quartered. And, that during this time, according to the opinion of some, they should never on any account be touched with the knife, axe, or pruning-hook. Some recommend the cutting off side shoots; others cutting them to the ground to make the better shoots. But this is probably the reason why, when oaks are cut up in expectation of finding them clean timber, that a variety of rotten knots grown over with sound wood appear in them, being the places where boughs had been cut off. It is certainly the case where they are advanced in growth, but in their infant state it is generally allowed, that they require judicious pruning. Mr. Marshall contends, that to hack off a large bough from an aged tree, is a crime of the deepest dye in the management of timber. But what relation has this mad act to the salutary operation of removing a twig from the stem of a young growing tree, or of pruning the boughs, or even removing the leader of a tree in a youthful growing state? In that case, the size of the wound and the exhausted state of the tree unite to prevent the healing, and a defect in the timber consequently takes place; whilst in this, the wound is inconsiderable, and the vigorous state of the tree enables it to cicatrize the sore, in a few months perhaps after the operation is performed. And by freeing the stems of young trees from side shoots, and keeping their leaders single, a length of stem is obtained; which by afterwards checking their upright growth, and throwing the main strength of the head into one principal bough, by checking, not removing the rest, a crookedness of timber is had; and what is equally necessary in ship-timber, a cleanness and evenness of contexture. The dangerous, and too often fatal defect caused by the decayed stumps of dead stem boughs being overgrown and hid under a shell of sound timber, a defect which every fortuitous tree is liable to, is by this provident treatment avoided; the timber from the pith to the sap becoming uniformly sound, and of equal strength and durability. So that nothing, it is supposed, but prejudice of the most inveterate kind, can reject a practice founded on the most obvious principles of nature and reason. The mischief done to hedge-row trees by injudicious lopping too generally observable, has arisen from the practice of taking large boughs from the stems of aged trees; not from training young trees during the early ages of their growth, which should always be done. See **WOOD**.

OAK-Bark, the cortical substance stripped from the bolls and branches of the oak-tree. It is used in tanning of leather, and afterwards as a manure, and has lately become a very expensive article. See **BARK** and **TAN**.

Every part almost of the oak is astringent; but it is only the bark that is officinal; and as the epidermis is perfectly inert, it is taken for medicinal purposes from the smaller branches, the epidermis of which is thin and scarcely cracked. The bark which is cut in spring is preferable to that cut in winter, as it contains four times the quantity of the astringent principle or tannin. Oak-bark yields its virtues to both alcohol and water. The watery infusion is affected by all those tests which indicate the presence of gallic acid, tannin, and extractive. Sir Humphrey Davy found (see Phil. Trans. 1803) that $\frac{3}{4}$ of the inner cortical part of young oak-bark affords by lixiviation grs. iii. of solid matter, of which 77 are tannin; the cellular integument, or middle coloured part, yields grs. 43 only of solid matter, of which 19 are tannin; and the epidermis furnished scarcely any quantity either of tannin or extractive. The quantity of tannin varies according to the size and age of the trees, and the season at which they are barked. Oak-bark is tonic and astringent; it has been given united with bitters and aromatics with seeming advantage in intermittents; but it is inferior to cinchona, and cannot be depended on. It is useful, however, in obstinate diarrhoea and alvine hæmorrhagies; and it is strongly recommended in the malignant coryza (snuffles) of infants, when in spite of keeping the bowels regular, and the use of cordials, the child becomes weak and pallid. Its principal use is as a local astringent. The dose in substance may be from grs. xv. to grs. xxx; but it is seldom given in this form, on account of the difficulty of pulverizing it. The officinal preparation of the "*Quercus pedunculata*," the bark of which has been above described, is the "*Decoctum quercus*" of the London dispensatory. This is prepared by boiling an ounce of oak-bark, in two pints of water down to a pint, and straining it. As a local astringent, this is used in form of a gargle in cynanche and relaxation of the uvula; as an injection in passive uterine hæmorrhagies, in leucorrhœa, and the gleety discharge which often remains after miscarriages. It is also an useful wash in piles and proclivita recti. Thomson's Dispensatory.

OAK-leaf Galls. These are of several kinds; the remarkable species called the mushroom gall is never found on any other vegetable substance but these leaves; and beside this there are a great number of other kinds.

The double gall of these leaves is very singular, because the generality of productions of this kind affect only one side of a leaf or branch, and grow all one way; whereas this kind of gall extends itself both ways, and is seen on each side of the leaf, in form of two protuberances, opposite the one to the other. These are of differently irregular shapes, but their natural figure seems that of two cones, with broad bases, and very obtuse points, though sometimes they are round, or very nearly so.

These make their first appearance on the leaf in April, and remain on it till June or longer. They are at first green, but afterwards yellowish, and are softer to the touch than many other of the productions of this kind; they are usually about the size of a large pea, but sometimes they grow to the bigness of a nut. When opened, they are found to be of that kind which are inhabited each by one insect only, and each contain one cavity. The cavity in this is, however, larger than in any other gall of the size, or even in many others of three times the size; the sides of it being very little thicker than the substance of the leaf.

It is not easy to ascertain the origin of the several species of flies, which are, at times, seen in this manner to come out of the same species of galls. It seems the common course of nature, that only one species of insect forms one

kind of gall; yet it may be, that two or three kinds may give origin to the same kind. There is, however, another occasion of our seeing different species come out of different galls of the same kind; and this is the effect of the enemies of the proper inhabitants.

It might appear that the parent fly, when she had formed a gall for the habitation of her worm offspring, had placed it in an impregnable fortress; but this is not the case; for it frequently happens, that a fly, as small perhaps as that which gave origin to the gall, produces a worm which is of the carnivorous kind, as the other feeds on vegetable juices. This little fly, well knowing that where there is one of these protuberances on a leaf, there is a tender and defenceless insect within, pierces the sides of the gall, and deposits her egg within it. This, when it hatches into a worm, feeds upon the proper inhabitant, and finally, after devouring it, passes into the chrysalis state, and thence appears in the form of its parent fly, and is seen making its way out of the gall, in the place of the proper inhabitant.

On opening these leaf-galls, which are properly the habitation only of one animal, it is common to find two, the stronger preying upon the body of the other, and sucking its juices as it does those of the leaf; often it is found wholly employed in devouring its unoffending neighbour at once: this is probably the case when its time of eating is nearly over; and, in fine, when we find the gall inhabited by only one insect, or containing only one chrysalis, as it ought in its natural state to do, we are never certain that this is the proper inhabitant, as it may be one of these destroyers who has eaten up the other, and supplied its place.

OAK-leaved Myrtle, in *Botany*. See *MYRICA*.

OAK, Mistletoe of the. See *VISCUM*.

OAK, Poison. See *POISON-WOOD*.

OAK Puceron, a name given by naturalists to a very remarkable species of animal of the puceron kind. The generality of such animals live on the surface of the branches and leaves of trees and plants; but these bury themselves in the clefts of the oak, and some other trees, and getting into the crevices, where the bark is a little separated from the wood, they there live at ease, and feed to their fill, without being exposed to their common enemies.

These are the largest of all the species of pucerons; the winged ones are nearly of the size of the common house-fly, and the naked, or such as have no wings, though less than these, are yet much larger than any other species of pucerons; the winged and naked kinds in these, as well as in the other species of pucerons, are all mothers, and great numbers of young ones may be pressed out of the body of either kind, when gently squeezed. The winged ones are black, and the others of a deep brown or coffee colour; they have the most remarkable trunk of any animal in the world; it is more than twice the length of their bodies, and has not its origin at the extremity of the head, as in other insects, but is fixed into the breast, near the origin of the first pair of legs. When the creature is walking, it carries this straight along the belly, and trailing a considerable length behind it, but with the point turned up, that it may be out of the way of accidents, and be ready to suck. When the creature has a mind to suck a part of the tree that is just before it, it draws up, and shortens the trunk, till it brings it to a proper length and direction; but when it sucks in the common way, it crawls upon the inner surface of the bark, and the turned up end of the trunk, which resembles a tail, fixes itself against the wood that is behind it, or contiguous to its back, and sucks there. The extremity of this trunk

holds so fast by the wood, that when it is pulled away, it frequently brings a small piece of the wood away with it.

The ants are as fond of these as of the other species of pucerons, and that for the same reason, not feeding upon them, but on their dung, which is a liquid matter of a sweet taste, and is the natural juice of the tree, very little altered. These creatures are the surest guides where to find this species of puceron; for if we at any time see a number of these crawling up an oak to a certain part, and there creeping into the cleft of the bark, we may be assured that in that place there are quantities of these oak pucerons. Reaumur's Hist. Inf. vol. vi. p. 64. 76.

The ants are so extremely fond of the juices of the tree, when prepared for them by passing through the body of this animal, that when the puceron has a drop not yet evacuated, but hanging only in part out at the passage, an ant will often seize on it there.

OAK, Sea. See *FUCUS*, and *WRECK*.

OAK-Snake, in *Zoology*. See *CROTALUS*.

OAK-Weeb, in *Agriculture*, a provincial word applied to the May bug in some places.

OAK Bay, or the *Devil's Heel*, in *Geography*, lies in the bay of Fundy, 9 leagues S.S.E. of Moofe island.

OAK Cove, a cove on the W. coast of North America, in the gulf of New Georgia.

OAK Island, a long narrow island on the coast of North Carolina, at the mouth of Cape Fear river. N. lat. 33° 52'. W. long. 78° 20'.

OAKFUSKEE. See *TALLAPOOSE River*.

OAKFUSKIES, the name of an Indian tribe in the western part of Georgia.

OAKHAM, a market-town in the foke of Oakham, and county of Rutland, England, is situated in the centre of a rich valley, called the vale of Catmose. This place is divided into two townships, or manors, the one denominated the Lord's-hold, and the other, the Dean's-hold. The former belongs to the earl of Winchelsea, who, as superior lord, holds an annual court for the election of the parish-officers, at which every inhabitant within its extent is required to appear, and pay one penny, or be amerced at the discretion of the clerk; and all free-holders, copy-holders, and waste-holders, must besides pay their acknowledgments. The latter manor is under the dean of Westminster, by whom a similar court is held every third year.

Oakham is the county-town of Rutlandshire; the assizes and shire-courts being always held here. The market-days, according to charter, are Monday and Saturday, but that on Monday is now discontinued. In the reign of king John an hospital was founded in this town by Walter Dalby, of Exton, for twelve poor men, and two chaplains. It is still supported, though comparatively much decayed and impoverished, as well as altered from its original design. The free-school, and Christ's-hospital, both owe their origin to Mr. Johnson, clergyman of North Luffenham, who built and endowed them by subscription, with the assistance of some lands, which he obtained from queen Elizabeth. The bishops of London and Peterborough, the deans of Westminster and Peterborough, the archdeacon of Northampton, and the masters of Trinity and St. John's colleges, Cambridge, are perpetual governors of the hospital last mentioned. The church here is dedicated to All-Saints, and is a spacious structure, consisting of a nave, chancel, and side-aisles, with a lofty tower and spire, which is seen at a considerable distance. The living is a vicarage, in the patronage of the earl of Winchelsea. Adjoining the church are ruins of an ancient castle, said to have been built in early Norman times by Walkelin de Ferrars, son of the earl of Derby. It afterwards

afterwards belonged to the lords Tateshal, but when king Richard II. advanced Edward, son of the duke of York, to the earldom of Rutland, he gave him this castle for his baronial residence. In the reign of Henry VIII. it was bestowed upon Thomas Cromwell, when he was elevated to the dignity of baron Cromwell of Oakham; and it is now the property of the earl of Winchelsea. There has long been a custom established here, that the first time a peer of the realm comes within the precinct of the manor, he forfeits a shoe from his horse, to be nailed to the castle wall, and should he refuse to give it, the bailiff of the lordship is empowered to take it by force. This due is now generally compounded for with money, and a shoe, made larger or smaller in proportion to the sum given in commutation, with the donor's name and titles cut on it, is fixed up in lieu of that from the horse's foot. Several horse-shoes, gilt and of curious workmanship, in consequence appear on the castle hall door, some of them of considerable antiquity, and others of recent donation. This custom seems to have been derived from the circumstance of the arms of the original owners of the castle bearing three horse-shoes.

The hall of this castle is now appropriated as a court-room, in which the assizes are held, and all the public business of the town or county is transacted. According to the parliamentary returns of 1811, the conjoint population of the two manors or parishes, with the small townships of Barleythorpe and Leighfield, in the suburbs, was estimated at 1709 persons, and the houses at 367 in number.

Burleigh house, the seat of the earl of Winchelsea, is situated about two miles to the north-east of Oakham, on an eminence near the village, whence it derives its name. This noble mansion is constructed of freestone, which was brought from Clipstone, the most northerly point of the county, and is of an oblong form; the south and north fronts being 150 feet in length, and those facing the east and west 96 feet, each subtending side resembling its opposite, both in elevation and design. On the south side the grand terrace commands a fine prospect of a rich country; and this appendage is thought to exceed every thing of the kind in the kingdom. Each end of it leads by several flights of steps into an extensive vale skirted by hanging woods. The grand entrance to this mansion, which is placed on the north front, is at once singular and grand. A noble court is entered by two handsome lodges, situated about 800 feet in a straight line from the hall door, to the left of which is ranged a very extensive and uniform row of stables, and on the right are other suitable offices. From this court, a beautiful circular colonnade, supported by Doric columns, runs up to the house. On the first floor of this edifice is a noble painted room, called the saloon, which is no less admired for magnificence and fine proportion than for its paintings, which represent the history and wars of Julius Cæsar. These were executed by Lanfroom, pupil of Verrio, who painted many rooms and detached pictures at Burgley, near Stamford. The library here is very extensive, and contains, besides a valuable collection of books, several curious preparations in anatomy and natural history, together with many valuable family pictures. Wright's History and Antiquities of the County of Rutland, &c. Lond. 1684, folio. Camden's Britannia, by Gough, folio.

OAKHAM, a township of America, in Worcester county, Massachusetts; 15 miles N.W. of Worcester, incorporated in 1762, and containing 801 inhabitants.

OAKHAM, *Ockham*, or *Oakum*, in the *Sea Language*, denotes the matter of old ropes untwisted, and pulled out again

into loose hemp, like hurls of flax, to be used in the caulking of ships.

White oakum is formed of untarred ropes.

OAKHAMPTON, in *Geography*, a borough and market-town in the hundred of Lifton, and county of Devon, England, is situated in a valley surrounded by hills, 22 miles distant from Exeter, and 195 miles from London. At the time of the Domesday survey, it was held by Baldwin de Brioniis, a Norman, whose exertions in the service of the Conqueror were rewarded by the office of hereditary sheriff of Devonshire, and a large grant of land which he constituted into the barony of Oakhampton, and built a castle here for his principal residence. This castle is mentioned in Domesday book, which also records, that the town had then a market and four burgesses. In the reign of Henry II., the barony became vested in Reginald de Courtenay, by his marriage with Hawise, a descendant and co-heiress of Richard, eldest son of Brioniis, and continued in the possession of the Courtenays till the time of Edward IV., when their attachment to the cause of Henry VI. rendered them the objects of Edward's rancour: earl Thomas was beheaded at Pontefract, after the battle of Towton-field in the year 1461; his brother John fell in the field of Tewksbury. Their possessions were confiscated to the crown; and Oakhampton castle was constituted a royal fortress, till Henry VII. restored it to the Courtenay family, with their other honours and estates; but his relentless successor, having discovered a secret correspondence between Henry de Courtenay and cardinal Pole, by one act of tyranny deprived de Courtenay of his head, and by another reduced the magnificent castle of Oakhampton to ruins, and devastated its noble and extensive park. The remains of the castle became the property of the Mohuns, from whom they descended to Christopher Harris, esq. of Heynes. The ruins of the castle are situated about one mile south-west of the town, on a high mass of rock: the extensive area which they include, the solidity of their structure, and the advantages of situation, prove that this fortress, before it was dismantled, must have been strong and important. A lofty keep rises magnificently from a large conical elevation, which is opposed on the other side of the stream by a steep wooded bank. The river Oke meanders through the valley, and runs immediately beneath the ruined walls.

The parish church, like the castle, is situated on an eminence at some distance from the town. In the market place is an old chantry chapel, the only building within the town worthy notice.

Oakhampton, though a town before the Conquest, was not incorporated till the reign of James I., by whose charter the civil government is vested in a mayor, eight aldermen, eight common-councilmen, a recorder, and a town-clerk. Previous to this charter, the chief officer was the portreeve; an office now held by the mayor for the time being, whereby the feudal and corporate powers are united in the same person. The earliest return to parliament for this borough was made in the twenty-eighth year of Edward I.; it was again represented in the seventh of Edward II. It then ceased to send members till the year 1640, when the privilege was restored; and two members have since been regularly chosen. The right of election is in the freeholders and freemen; the number of voters being about 180. The population of the parish in the year 1811, as stated in the parliamentary survey, was 1440 persons, occupying 227 houses. The chief support of the inhabitants is derived from the manufacture of serges, and the expenditure of travellers; the turnpike road from Exeter to Launceston, Falmouth,

Falmouth, &c. passing through the town. Four fairs are annually held, and a market weekly on Saturday. Warner's Walk through the Western Counties, 8vo. 1800. Beauties of England, vol. ii. by J. Britton, and E. W. Brayley.

OAKHAMSTON HEAD, a cape of Scotland, on the S.E. coast of the county of Caithness. N. lat. $58^{\circ} 15'$. W. long. $3^{\circ} 8'$.

OAKINGHAM. See WOKINGHAM.

OAKMULGES, a river of America, which is the southern great branch of the Alatomaha, in the state of Georgia, and, with the confluence of the Oconee, forms this great river.

OALALDA, a town of Africa, in the country of the Foulis; 30 miles E.S.E. of Sibbé.

OAMI, a town of Japan, in the island of Nippon; 25 miles S.W. of Morifa.

OAMY, in *Agriculture*, a provincial term applied to such ploughed lands as are light, porous, and flowery in the nature of their soil.

OANDA, in *Geography*, a town of Africa, in the country of the Foulis, on the Senegal; 70 miles S.E. of Goumel.

OANUS, in *Ancient Geography*, a town of Asia, in Lydia.

OAR, in *Navigation*, a long piece of timber, flat at one end, and round or square at the other, whereby a boat, barge, galley, &c. is rowed, or advanced along the water.

That part of the oar which is out of the vessel, and which enters into the water, is called the blade, or wash; and that which is within-board is termed the loom, whose extremity, being small enough to be grasped by the rowers, is called the handle.

In a vessel with oars, the water is to be considered as the point of support, or fulcrum; the oar as a lever; the boat as the burden to be moved; and the rower's hand as the moving power. See LEVER, and MECHANIC Power.

The burden is to be considered as applied to that point of the lever where the oar rests on the boat; which point, in large vessels, is called the *row-port*, but in lighters and boats it is always termed the *row-lock*. The greater, therefore, the distance of the hand from that point, and the less the distance of the water from that point, the greater effect will the oars have.

OARS, *To ship the*, is to fix them in the row-locks ready for rowing.

OAR, in *Natural History*. S. ORE.

OARACTA, in *Ancient Geography*, a large island of the Persian gulf, situated upon the coast of Caramania, and inhabited, according to the journal of Nearchus's navigation.

OARII, in *Geography*, a province of Angola, on the N. bank of the *Congo*.

OARISTIS, or OARISTYS, a term in the *Greek Poetry*, signifying a dialogue between a husband and his wife; such as that in the sixth book of the *Iliad*, between Hector and Andromache.

Scaliger observes, that the oaristis is not properly any particular little poem, or entire piece of poetry; but always a part of a great one. He adds, that the passage now cited in Homer, is the only proper oaristis extant in the ancient poets.

OARUS, in *Ancient Geography*, a river of Scythia, which, according to Herodotus, sprung from the country of the Thyssagetæ, traversed that of the Mæonæ, and discharged itself into the Palus Mæotis.

OASIS, derived from the Coptic word *Ouabe*, signifying a habitable place, a fertile island in the midst of the sandy desert of Africa. Of these Oases, which are called

islands, because they appear like such in the midst of an ocean of sand, there are several that lie at the distance of 100 miles or more from the Nile, to the W. of it. The Arabian geographers were acquainted with these detached fertile spots, and called them "Elouah," "Ellouah," or "El-wah." Abulfeda says, these Elouahs are dependent on the Saïd, and that they are islands in the middle of sand. On quitting the Nile, this author states that it takes three days' journey across the desert to arrive at them. Jacout, who reckons three of them, places them in the west of Lower Egypt, beyond the chain of mountains, parallel with the river. Abulfeda adds, that the first is well cultivated; that it possesses abundant rivulets, hot springs, fields covered with harvests, and other surprising things, but that the people there are wretched. Ptolemy places the largest of them, "Oasis Magna," or "El-wah," under the parallel of 27° ; the second in $25^{\circ} 45'$, i. e. over-against Behnéfé; and the most northerly in $29^{\circ} 30'$, under the parallel of lake Mæris. The sandy desert in which these Oases are situated, is occasionally traversed by the Muggrebin Arabs, who form a ferocious tribe, and might fend forth, if they could be united, 30,000 men capable of bearing arms; but as the tribes are divided by intestine enmities, their parties seldom exceed 4 or 500. The Lesser Oasis, "Oasis Parva," now "El-wah-el-Ghurbi," forms a kind of capital settlement of the Muggrebin Arabs, who extend even to Fezzan and Tripoli. They are dressed in a linen or cotton shirt, over which is wrapped a blanket of fine gannet; all have fire-arms, and are good marksmen, and their muskets are their constant companions. Their chief employment consists in breeding horses, the sales of which they sell, using the mares in their warlike expeditions, camels, and sheep. They are very hardy and abstemious; a small cake of bread and leathern bottle of water supplying a man with ample provision for a day. At El-wah-el-Ghurbi, it is said, that several ruins are to be found. The "Oasis Magna," called "El-wah," is at some distance from the other. Mr. Brown (see his Travels in Africa) received information from the Muggrebins at El-wah, that Charjé, the most northern village of that district, was but two days' journey from the nearest part of "El-wah-el-Ghurbi," that is, about forty miles. Oasis Magna, he says, seems rightly to correspond with the latitude of Dendera, and of course that of the southern extremity of Oasis Parva should be a little to the south of that of Assiût, and not far north of Tino des Mons, in D'Anville's map; apparently the chain on the E. of both the Oases. On the W. he observed no mountains, nor on the south. The most northern Oasis known near Egypt is that of Siwah, or See-wah. According to Ptolemy, who, in the opinion of Rennell, is more correct than Abulfeda in settling the situation of El-wah, or the Great Oasis, its distance from Ptolemais on the Nile, in the direction of west, somewhat southwardly, is 105 miles. This island, according to Arrian, is not more than forty stadia in extent; Diodorus makes it fifty; that is, six or seven miles. All accounts agree, that it has one or more fountains of waters, and that it was planted with divers kinds of fruit trees: Arrian particularly notices the palm and olive. What appeared to be a very great natural curiosity was a fountain, which, according to Arrian, varied in its temperature in a very singular manner; being very warm or hot at midnight, and very cold in the heat of the day. Rennell supposes that the fountain, being a deep-seated spring, would preserve a mean degree of temperature at all seasons; so that, in effect, it was the atmosphere that underwent the change, and

and with it, the bodies of those who made the observations. This fountain was called the fountain of the Sun. The site of the ancient temple of Jupiter Ammon, (see AMMON,) was four or five days' journey inland from the plain of Gegabib, famous for its dates; and Gegabib is seven days' journey from Augela, N. lat. $29^{\circ} 20'$, towards Cairo, and these distances are sanctioned by the authority of Herodotus, Strabo, Pliny, and Arrian. Herodotus (l. 4.) says, that the temple is situated ten days from *Ægila* (Augela); frequented by the Nafamones, on account of the dates, and on the road from Thebes to *Ægila*. Arrian says, on the authority of Aristobulus, that Alexander went to it from the site of his new city of Alexandria, along the sea-coasts of Egypt and Marmorica, to Parætonium; which latter was situated; according to the same authority, 1600 stadia from Alexandria. Pliny assigns to it 200 Roman miles. These accounts are perfectly conclusive; and the position of Parætonium is also clear in Ptolemy, and is known to the moderns under the name of Al Bareton. Arrian says further, that Alexander struck inland from Parætonium, and entered the desert; but he does not say how far the temple lay from the sea-coast. This is supplied by Strabo (lib. 17.), who gives the distance at 1300 stadia. Allowing these to produce 130 or 140 miles; and taking Herodotus's ten days from Augela at 170, the meeting of these lines of distance places the temple in latitude 29° and a small fraction, and in a south-westerly direction from Parætonium. Pliny says, that the temple is 400 (Roman) miles from Cyrene; that is, twice as far as Parætonium is from Alexandria; and this agrees with the former position. Ptolemy places it at 195 geographical miles from Parætonium, or by correction 166; and from Cyrene 340. The several authorities above recited do not vary among themselves more than thirty miles; and they may, therefore, be considered as conclusive. Upon the whole it may be concluded that the site of the temple of Jupiter Ammon should be at least twelve days from El-wah.

The temple was surrounded by a triple wall, forming three distinct divisions: one of which was appropriated to the use of the monarch. In the time of Herodotus, when probably the temple was in its glory, the dominion of the Ammonites reached within 10 days' journey of the city of Thebes: the people were a colony of Egyptians or Ethiopians, and spoke a mixed language. Ammon, or Hammon, was the Egyptian name of Jupiter: and the image of the god, similar to that at Thebes; that is, it had the head of a ram. (See AMMON.) In the time of Strabo, about 450 years after Herodotus, the temple was almost deserted; as the oracle was grown out of fashion. It is probable, says major Rennell, that some remains either of the triple wall, or of the temple, may be found at this day; although the materials may have undergone a different kind of arrangement. See-wah appears to be the nearest town to this Oasis; and is probably no more than six days' journey on the N.E. of it: the spring, together with the ruins of the temple and the triple wall, might ascertain to a curious inquirer the precise spot.

Under the sovereigns of the lower empire, the Oasis became a place of exile: and both Sectaries and Catholics were sent thither alternately. Nestorius and Athanasius were exiled thither. These habitations, become famous on account of the banishment of the most learned personages of the lower empire, were little known by the Persians. Cambyses, after ravaging Egypt, wished to carry off the spoils of the temple of Jupiter Ammon. The troops he sent against the Ammonians left Thebes and arrived at the city of

Oasis, says Herodotus, inhabited by the Samians of the tribe of Escrionia. This country, distant seven days' march from the capital of Egypt, is called by the Greeks, "the Isle of the Happy." It is reported that the army reached their place of destination, but the Ammonians alone knew what become of it, for it has never since been heard of. It is said also, that being on their march towards the temple of Jupiter, and having got half way, it was swallowed by torrents of burning sand blown up by the southerly wind.

The Oasis of Ammon is little known by the modern Egyptians. They are better acquainted with the second, where Abulfeda places a city called Behnéfé, different from that on Joseph's canal. He marks another higher up, corresponding with that of Achmounain, around which are observed magnificent remains of antiquity.

The great Oasis, which is the most frequented of the three, being on the road of the caravans of Abyssinia, contains a great number of inhabitants. The bey of Girgé sends a chief there as governor, and to collect a tribute. The geographer of Nubia describes the country of the El-louah, situated to the west of Assouan, as having been formerly much peopled. At present, he says, it has no inhabitants. We meet with abundant springs there, and fruit trees, with cities buried under ruins.

OASITES NOMOS, nomes of which there are two in Egypt, placed by Ptolemy near the lake Mæris.

OAST. See OOST.

OASY. See OAZY.

OAT, *AVENA*, in *Botany*. See *AVENA*.

OAT, in *Agriculture*, the name of a well-known species of grain, of which there are several varieties cultivated in different districts of the kingdom. But the most common sorts cultivated in England, are the *white*, the *black*, the *brown*, or *red* oat; the *blue*, the *Poland*, the *Friesland* or *Dutch*, the *Siberian* or *Tartarian* oat, the *Essex short small*, the *Church's* oat, and the *potatoo* oat.

The *white* is met with in the southern parts of the island; it makes the whitest meal, but is chiefly cultivated where the inhabitants live much upon oat cakes.

The *black* is more generally cultivated in the northern parts of England, and is esteemed a hearty food for horses. It bears a wet harvest well, and answers on the wettest soils more perfectly than the other sorts.

The *red* oat is much cultivated in Derbyshire, Staffordshire, and Cheshire, but is rarely seen in any of the counties near London; though as it is a very hardy sort, and gives a good increase, it would be well worth propagating, especially on strong land: the straw is of a brownish-red colour, as is also the grain, which is very full and heavy, and esteemed better food for horses than either of the former sorts.

The *blue* or *blea* oat is said to have been sown about Kighley in Yorkshire. It is probably the same with what is cultivated in Lincolnshire, &c. under the name of *Scotch greys*.

The *Poland* oat has a short plump grain, but the thickness of the skin seems to have brought it into disrepute among farmers. The grains are mostly single, it has no awn, and the straw is short. It answers best on dry warm soils and situations.

The *Friesland* or *Dutch* oat affords more straw, and is thinner skinned than the above kind. The grains are mostly double, the larger one sometimes awned, with the awn placed high. It is not so much sown as formerly.

In the *Siberian* or *Tartarian* oat, which is considered by Mr. Marshall as a distinct species, each flower frequently contains three perfect florets, never less than two, with a pedicelled

pedicelled rudiment of a third. The panicle differs essentially from all the other varieties, the grains are thin and small, the largest awned, the small ones awnless; the straw is tall and reedy, and of course not so valuable as fodder.

The *Effex short small* is, according to Mr. Young, remarkably short and plump, and weighs better than most other kinds. It does well on any land that is tolerably dry.

The *Church's* oat yields well; it is white, and comes into ear more early than any other oat.

The *potatoe* oat, which is but lately introduced, is very heavy and yields largely, but the stem is reedy.

In addition to these species and varieties, there is another species sometimes grown, which is the *naked* oat, which Linnæus has observed, is very nearly allied to the foregoing, differing in little else, except that the grains quit the husks, and fall naked when they are ripe.

It is said to be sown in Cornwall in the poorest croft-land, that has been tilled two or three seasons before with potatoes, and for the uses of the poor answers all the purposes of oatmeal. It is a small yellow grain, and for fattening calves accounted superior to any other nourishment.

The oat has an annual fibrous root with the culm of straw two feet high and upwards, having the panicle various in the different varieties, but always loose with the subdivisions of it on long peduncles and pendulous. And the two glumes or chaffs of the calyx are marked with lines, pointed at the end, longer than the flower, and unequal. There are usually two flowers and seeds in each calyx: they are alternate, conical, the smaller one is awnless, the larger puts forth a strong, two-coloured bent awn from the middle of the back; both are cartilaginous and fertile.

A late practical writer states that this sort of grain is hardy, and may be cultivated upon almost any kind of soil; but, as in others, it is the most productive on such as are strong, rich, and adhesive, and which have been newly broken up from the state of grass. It is suggested by the author of the report of Middlesex, that though this sort of grain generally sells lower than barley, yet, from its being a more certain crop, the superior utility of the straw for the food of cattle, and the increase in the quantity of produce, it is equal to barley for medium loams. And that for stronger sorts of lands, and those of the fen kind, it is generally superior to it, though apt to leave the land in a more foul and compact condition. On the cold, tenacious, senny, and wet descriptions of soils, the oat may, indeed, in many cases be sown with more advantage than any other kinds of crop, and likewise where lands cannot be put in a proper condition for barley crops. It is added that oats succeed well, after almost every sort of green and root crops, but should not be cultivated after wheat, rye, or barley, where it can possibly be avoided, as the soil by such cropping would be too greatly exhausted. It has been observed by the author of *Modern Agriculture*, that, in districts where improved methods of husbandry are adopted, oats are generally sown upon such lands as have been newly broken up from the state of grass, and that the practice is shewn to be perfectly correct by the abundance of the produce in such cases.

The author of the *Calendar of Husbandry*, after observing that white oats should be sown in March in preference to any other season, remarks, that in the general conduct of them the farmer should by all means avoid the common error of sowing them after other corn crops, by which they exhaust the land. They should always receive the same preparation as barley, nor ought a good husbandman to think of their not paying him as well for such attention as that crop. It is a very mistaken idea to suppose it more profitable to sow

barley on land in good order than oats. He is from divers experiments inclined to think that oats will equal, and in many cases exceed barley. The superior quantity of the produce will ever be found to more than answer the inferiority of the price; which, however, sometimes exceeds that of barley. What good reasons are to be offered for sowing oats on land in such bad order that barley is not to be ventured in, he knows not. The common argument is their hardness, which will give a middle produce, about sufficient to pay expences and leave a trifling profit, when no other crop will do the like. But this is only proving them to be assistants to bad husbandry; nor is such a paltry profit, granting false premises (for he is well persuaded that common oat crops, among bad farmers, are but so much loss), an object that ever ought to influence good husbandmen. Why should a good farmer be at all solicitous to gain 10s. an acre, profit by oats after barley, &c.? Suppose his course to be, 1, turnips; 2, barley; 3, oats: or, 1, fallow; 2, wheat; 3, oats: in either of these courses, or in any other, where the oats follow another crop of corn, the profit of them must be small. What comparison with sowing clover with the barley, which will pay far more profit, and at the same time prepare, in the best manner, for that most beneficial crop, wheat? What but a fallow, or a fallow crop, can succeed the oats? How unprofitable, compared to the clover system! For these reasons he cannot but recommend that oats should be considered in the same light as barley, and never sown unless the land be in proper order for barley, or to sow them after a fallow crop, and clover with them, in the same manner as barley. And to the practice of sowing them after turnips, the same observations which have been made on barley, are equally applicable. The farmer should, in the distribution of his farm, consider which of these two crops is likely to pay him best. This will very much depend on the soil. Warm forward lands yield as many quarters of barley, perhaps, as of oats; but upon various other soils, the produce of oats, compared with that of barley, will be four to three, and on some as five to three. He should also take into consideration, the greater steadiness of price which oats have for many years yielded, in comparison of the price of barley; circumstances which may reasonably induce him to sow them in a larger proportion than is common among his neighbours. On the other hand, it is not to be forgotten that they exhaust more in general.

In regard to the method of putting oats on lays, which is very common husbandry both on one ploughing of old grass, and on layers of shorter duration; the method is to plough the land before the frosts, and to dibble in the spring, as soon as the weather is dry enough; but the soil must, from its nature, or from rolling, be in such temper as to permit the holes to stand, and not to moulder in, when the dibble is removed. In some cases, the safest way is, to plough, roll, and dibble immediately. This practice is but little used at present. But in very many cases (possibly in all) it is better to put pease in on light land, beans on stiff soils, and to follow these with oats or wheat, according to circumstances; he has known oats which had produced inferior crops followed by oats again the next year, and produce largely; which proved that they wanted tilth. Pease or beans will rather improve than exhaust land when put in thus in layers, whereas two crops of oats will scourge the land too much. Let it, however, be well remembered, that these observations are made (so far as they relate to old grass) on the supposition that the farmer will not or is not allowed to pare and burn, a method vastly superior, and which ought to be pursued in all cases where it is practicable. The custom of cultivating oat crops in succession for several years is, therefore, without doubt,

doubt, equally absurd and improper, and should be generally exploded and reprobated as highly mischievous.

Preparation.—In the preparation of the land for this sort of crop, it is recommended in the Middlesex report, that when it is intended to be grown, after cole, tares, early peas, or such other crops as do not come off the ground later than the beginning of June, on soils that are too wet to admit of being ploughed in the winter season, to make a clean bastard fallow, laying the land up into ridges proper for being sown in the early spring. Or when, after such clean crops as come off too late to admit of bastard fallowing, to plough only once, which should be as early as the business of the farm will admit, into ridges proper for putting the seed in. Where the land is inclined to be moist, the best mode is probably that of ploughing the land on to proper ridges, in the autumn, in order to its being rendered fine and mellow for putting in the crop in the early spring, by means of scarifying and scuffling without any further ploughing, as has been shewn in speaking of barley. See BARLEY.

But Mr. Donaldson states, that whatever may have been the nature of the crop that preceded this, it is but in very few cases that more than one clean furrow is afforded. In some districts it is, he asserts, the common practice to plough the lands over that are intended for oats, in the autumn, in a particular manner, so as to expose as large an extent of surface to the influence of the atmosphere as possible. This in some places is termed by farmers *rib-furrowing*, and in others *lob-furrowing*; it is performed by turning over the furrows at the distance of from twelve to eighteen inches from each other on the unbroken land. In this way one-half of the superficial part of the land remains unmoved, and the furrows being thrown on it, much surface is exposed, and the soil greatly improved, at the same time that the root weeds are destroyed. If this process be accomplished in the most perfect manner, and in the autumnal season, the soil is considerably ameliorated and improved by the frosts during the winter; and by being well broken down by the harrow in the spring, having a complete ploughing immediately before the seed is put in, the soil becomes in an excellent condition for this sort of crop, even where the land is of the stiff and heavy kind. On which the author of *Practical Agriculture* has remarked, that there can indeed be little doubt but that, by the land's undergoing a more full and complete preparation than is usual for this crop, the quantity of produce may be greatly increased, as the fibrous roots of the plants are more enabled to extend themselves in the loose earth, and thereby to afford a more perfect support to the plants. In some cases, as where the land has been much reduced and exhausted by the previous crops, or in breaking up thin poor soils, where the proportion of turfy material is considerable, and when the prices of other sorts of grain are low, it may be advantageous to have recourse to the use of manure, as by such means it is probable that a third more produce at least might be grown.

Time of sowing.—In speaking of the time of sowing, or putting this sort of crop into the ground, the same writer states, that it is necessary to keep in mind that the earlier the seed is put into the ground, the sooner, in general, the crop will be ready to cut. In the more southern parts of the kingdom, it is often the case to put this sort of seed into the earth towards the latter end of February, when the season is dry and fine; but March is, in general, the oat-feed season. On such soils as are naturally dry and parching, it is however by much the best practice to sow early, in order that the crop may be well established before the hot weather commences. And besides, there may be a greater chance of the

grain escaping the ravages of the worm that often attacks such crops; and when this insect is present, its ravages may be more easily prevented. As this sort of crop is liable to be injured by very severe winters, it can seldom be safe to put it in in the autumn, especially in the northern parts of the island; but in the southern districts it may be done with propriety in particular cases, as where the land is of a very dry and friable nature, large crops having been asserted by Mr. Middleton to have been grown in this way in combination with tares in some instances. But in many cases this kind of crop may be sown still more early: Mr. Young advises that, in January, if the weather be open, the young farmer should examine such fields as he intends sowing with oats, that he may consider if he has any apprehension of having his hands full of business in February and March, whether he should lessen the work of those more busy seasons by sowing some oats at this period. The temper of the soil must govern him: but it is necessary that he should know that oats sown so early succeed well. And this has been fully shewn by the interesting experiments made by the late Mr. Macro, of Suffolk, and the present earl of Winchelsea, and detailed in the *Annals of Agriculture*. The first states, that having tried early and late sowing of barley, in the year 1784 and in 1785, he had a mind, the following season, to try the same experiment with white oats; and began by sowing one acre, in December 1785, with one coomb of seed, harrowed in upon a wheat stubble, with one earth. Value of land 10s. an acre.

And in January 1786, he sowed exactly another acre by the side of it, with the same quantity of seed, and dressed it in the same manner. In February another acre the same, except half a bushel less seed. In the beginning of March he ploughed the remaining part of a piece of land a second time; and, about the middle of that month, sowed it, at the rate of three bushels of seed an acre, ploughing in one cast, or half the seed, and harrowing in the other half; and marked out another acre for the experiment. This last acre had three clean earths.

The produce of the four acres was as below:

			C.	B.	P.
On that sown in	December	-	8	2	0
_____	January	-	8	3	2
_____	February	-	6	2	1
_____	March	-	6	2	2

On seed deducted:

			C.	B.	P.
On that sown in	December	-	7	2	0
_____	January	-	7	3	2
_____	February	-	5	2	3
_____	March	-	5	3	2

It is added that that sown in December, though it came up thick enough at first, lost so much of its plant, by the winter frosts, that it was expected it must have been ploughed up, and sown again in the spring; but observing the plants that were alive beginning to flourish very early, he gave them time, yet it never got to be a full plant, nor did he expect, though the straw was very short, and the haws, or ears, very fine ones, that it would have turned out so well. Those sown in January and February both lost some of their plants, so that that sown in March, with the least seed, was the fullest and evenest plant of any.

The latter of the above gentlemen states, that he was induced to make the following trial, from having seen upon two very capital farms in Kent and Essex, great crops of oats, sown as early as Christmas week, and from being informed

formed by the gentlemen who occupied those farms, that they always sowed their oats as early as that, if the season admitted of it; and that they thought it the best time for sowing that grain. He wished to ascertain whether this plan would answer in this more northern county. The general time of sowing oats here is from the beginning of March to the end of April; and it is the opinion of most people here, that oats sown much earlier would be liable to be destroyed by spring frosts. The last winter was very favourable for the experiment, as the weather was open at Christmas for sowing, and the frost in the spring not severe. He divided a field of eight acres equally: one-half was sown the day after Christmas day; the other half the middle of March. Five bushels *per* acre were sown broadcast on each part, and the same oats: the first a small white oat, here called *short smalls*. The early sown were ripe and cut one week before the others; they were harvested equally well, without being exposed to any bad weather. He had a rood of each set out very carefully in the middle of the field, reaped, and threshed as soon as carried. The produce and weight were as follow:

	Winch. Bush.		Qrs.	P.
Early sown	- 22	<i>per</i> acre	- 11	0
Late sown	- 19	ditto	- 9	4

And the weight *per* Winchester bushel as soon as threshed:

Early sown	- 44½lb.
Late sown	- 42½lb.

The crop was very good. The land yielded potatoes the preceding year, 450 bushels *per* acre, and was not manured for that of the oat crop: it had before that been in grass for six or seven years. The soil a red loam. He is inclined to think that the early sowing will answer here, as this field is very high and much exposed.

It would seem that there can be little doubt from the tolerably hardy nature of this sort of grain, but that in many instances it may be put into the ground at such early periods with great advantage. And in all late situations it would probably be more beneficial to put the crops in at much earlier periods than is usually the case in most places.

Quantity of Seed.—In regard to the quantity or proportion of seed that may be required, it must obviously differ according to the difference of the circumstances that have been stated above; but on soils of middling quality, Dr. Dickson supposes four bushels may be sufficient for the more early sowings, and five for the later ones, where they are put into the ground in the broadcast method, which should constantly be the case where the first modes of preparation are adopted. In some of the southern districts, the *Poland* oat is sown at the rate of about four bushels the acre for the first sowings; and it has been found in practice that the earliest sown crops constantly afforded the most perfect sample, and in general the most abundant produce. With the oats, clover may be sown when necessary, the seeds being covered by harrowing suitably to the condition of the land; and where the soil is very light or mellow, a roller should be passed over it as soon after as possible, in order to press the mould to the seeds: but in other circumstances it may be more advisable to defer the rolling until the season is dry, and the crop somewhat advanced in its growth. The practice of sowing oats under furrow, though it has been attempted on the lighter and more dry sorts of land, is not by any means to be advised, as in such a method, the seed is apt to be deposited to too great a depth, and to be in danger of either being in some measure destroyed, or of coming up in an irregular manner. It is added, that the use of the drill has not been so

much practised with this sort of crop, as to fully ascertain the utility of it; nor has that of dibbling been tried with that sort of attention that is necessary to determine the propriety of it. According to Mr. Young, Mr. Walker, near Belvoir Castle, Lincolnshire, sows eight bushels of oats *per* acre, and finds the crop much better, and the sample more equal than with less seed; the oats are less *taily*, no tillers to give different degrees of ripeness, and the crop ready to cut four or five days sooner than with thinner sowing. Mr. Duckett is of the same opinion, and holds no idea cheaper than that of recommending the drill husbandry as saving seed; he drills five bushels of oats *per* acre on his land.

And the same practical writer further states, that as this kind of grain is supposed to be more liable than most others to degenerate, by being too long continued on the same land; it has been the practice of some districts to change it for such as has been imported from other countries. It is probable, however, that by collecting and sowing the best and most perfect of our own produce, this expensive practice may be rendered unnecessary. By similar attention, most of the different sorts of oats are also capable of being greatly improved both in the quality and appearance of the grain or sample.

It is also added, that where this sort of grain is cultivated on such lays as are nearly broken up, there may frequently be danger, especially where the land has been long in the state of grass, both from the destructive attacks of insects, and the soil becoming too light, open, and porous, from the decay of the grassy material, for the support of the plants. The first may probably in some measure be obviated, by eating such lands very close with sheep previous to their being broken up, as by such a method the ova of such insects may be much destroyed, and their propagation prevented. And the treading the crops by sheep, as well as the roller, may likewise be beneficial in both respects. According to Mr. Bannister, horses have also been turned in for the same purpose. For the above reasons, it has been suggested as improper to put oat crops in on newly broken upland, or what in some districts is termed a *lea breech*. For to sow oats on a lay newly broken up, especially if such ground has been many years in grass, is at all times very hazardous, and frequently causes a total destruction of the crop, an instance of which he experienced in the spring of the year 1771. The preceding winter had been very severe, with a continuation of unkindly weather till late in the spring, for at the close of the month of April, the ponds were covered with ice, and sharp frosty nights intervened till the 10th of May. Early in the month of March he sowed with oats a fairfain lay, that had been ploughed up some months before, and covered in the seed with the large two-horse harrow, and as soon as possible closed the soil with a five-horse roll, so that the ground seemed to lie as close as one could desire; but the dry frosty weather above mentioned, setting in for a month afterwards, rendered the surface very porous, and the soil was become dry as ashes, and by far too light for the purposes of vegetation. Towards the middle of April, the oats, by favour of some kindly showers, began to make their appearance, but before they were all fairly out of the ground, the worm seized on the fibrous roots below the surface. The land being at that time not sufficiently dry to admit the use of a roll, he endeavoured to close the lightened soil by treading it with horses. His primary views were to have trodden the upper part of the field only, the lower side remaining at that time unhurt by the worm; but in a few days these insects spread over the whole close, and although he omitted no

oppor-

opportunity of treading and rolling throughout the spring, the crop at harvest was very slender, as well in straw as grain. From hence we may learn how hazardous it is to sow such lay ground, in the first year after breaking up with oats, or indeed of cropping it with any other grain, than either pease or beans; for though in a very kindly year, such corn may not be totally destroyed by the worm, as it turned out in the event, with the greatest part of his oats; yet there is no doubt but (maugre all his care and pains) the husbandman will then find cause to repent of his conduct, and should a dry frosty time succeed, the destruction of the crop is inevitable. Still more hazardous is it to sow this grain on what is termed a lay breech, as the worm will in such a season be more likely to destroy the crop, than even after the first breaking up of the lay ground. Peas and beans, according to the nature of the soil, are generally considered as the most proper sorts of crops in these cases.

Sowing seeds with.—In general it is considered as a better and more correct practice to sow grafs seeds with this crop than barley, as the tillage requisite for the latter may dispose it to become rank and be lodged, by which the grafs will be drawn up weak through it, and in that way be greatly injured, as well as the barley, by the humidity thus produced, require a long time in the field, and in that way be exposed to more danger in case of a wet season succeeding, while with oats there is little risk in these respects, as the straw is much stiffer and more firm. Where oat crops are thin upon the ground, they grow strong, and are consequently better capable of supporting themselves without falling on the ground or lodging.

Culture afterwards.—In regard to the culture that is afterwards necessary for this sort of crop while growing, it is merely that of keeping it as clean and free from weeds as possible, by means of hoeing and hand-weeding, throughout the month of May. The crops, that are drilled, should be well cleaned in the rows by the hand as well as the hoe. The author of Practical Agriculture states, that it is also a practice in some places to pass a light roller over the crop, after it has advanced a few inches in height, when the ground has been slightly moistened by rain; by which the cloddiness of the surface is reduced, and the plants in some measure earthed up, and the progress of the crop not only much promoted, but, where thin, the plants rendered more thick upon the land by the tillering that is thus produced. And he adds, that it is sometimes a practice in this sort of crop, as well as that of wheat, where there is danger of its being too rank or luxuriant in its growth, to feed it down with sheep in the spring months. This is not however a method that is to be adopted, except in particular circumstances, as where there is a great difficulty in procuring sheep feed at such periods, or where the worm is committing its ravages upon the plants; as this sort of grain is not in general apt to be injured either by the luxuriance of its growth, or by being lodged on the ground.

Reaping the Grain.—It may be stated, that oat crops are ready for the scythe or sickle, when the straw exhibits a yellowish cast, the grain becomes hard, and the chaff opens in such a manner, as to render it in some degree naked. This sort of crop does not require to be so dry when put into the stack, as those of either the wheat or barley kinds. The reaping of this sort of crop, where cut low, is a good practice, as in other modes, what is left in the field, is lost to the farm-yard. The sheaves in wet harvests should not be made too large, or be bound up when in a damp state. It is seldom that this sort of crop need be kept out in the field any great length of time after it is cut.

General Application.—With respect to the application of this sort of crop, in the northern counties, the meal is frequently made into a wholesome bread, and used in other articles of human food; but in the southern districts its principal use is for the food of horses, for which purpose it is reckoned very nutritive, being sweet and of an opening nature: but it must not be given them before it has sweated in the mow, or been otherwise dried, lest it should prove of too laxative a quality.

OAT, in the *Materia Medica*. Some physicians have formerly recommended a diet drink made of oats, in various distempers. The method of preparing the drink is as follows: take of recent oats, entire and well washed, one pound and a half; of the fresh root of succory, cut into slices, one handful; spring water, twelve pints; boil all together in a clean earthen vessel to the consumption of half, and then strain the liquor through a linen cloth, and add to it fix ounces of coarse sugar, and half an ounce of sal prunellæ; let it boil again, and afterwards be taken off the fire, and set by, for a day and a night, in a cool place; then pour off the clear liquor, and keep it in a cellar in vessels close stopped.

Two ordinary cupsful of this liquor, given twice a-day, three hours before, and as many after dinner, have been said to perform wonders in the cure of all kinds of fevers, colic pains, pleurifies, itches, cutaneous tumours, and hypochondriacal disorders; as also in cleansing the kidneys from sand, and opening the obstructed viscera. The use of it is ordered to be continued thirteen days, and, if the patient be cachochymic, a gentle purge is to be given before it is taken. It is accounted a great preservative against illness, if taken thrice a-year, in spring, in autumn, and in the dog days; and the inventor of it, Joannes de St. Catherina, is said to have kept himself alive by it to the age of an hundred and twenty years, without any diseases.

Dr. Lower having tried it, and found its good effects, by repeated experience, made it public, and the celebrated Hoffman has written an express treatise about it, in which he recommends it both in intermittent and continued fevers, but advises purified nitre to be used instead of the sal prunellæ, and observes that the two boilings, ordered by Dr. Lower, are not necessary, but that the sugar and nitre may be added at first. It must be kept carefully in summer, otherwise it soon becomes sour and unfit for use.

Those who desire to have it coloured may boil in it an ounce of alkanet root, and two ounces of red sanders, which will give it a fine red colour, without at all affecting its virtues.

Oats, when freed from their cuticle, are called *groats*; in which state, as well as when ground into meal, they are used both dietetically and medicinally. In both states they yield to water by coction the fecula they contain, and form a nutritious amylaceous gruel, which is best made by putting three ounces of groats into four pints of water, and boiling slowly until the water be reduced one-half; then straining through a sieve to separate the undissolved part of the groats from the gruel. The nutrient qualities of oats are well known. The meal constitutes the chief support of the poor; and for infants, deprived of their natural and proper nourishment, the breast-milk, no better substitute can be adopted than thin groat gruel mixed with good cow's milk. The gruel should not be kept longer than 48 hours, as it becomes aced after that period.

Oats have not been chemically examined; but the greater part of their substance appears to consist of fecula or starch.

For medical purposes, gruels, or decoctions of groats or of oatmeal, are excellent demulcents, and they are therefore very frequently prescribed in inflammatory diseases, diarrhoea, cholera, dysentery, calculus, and in most febrile affections. They may be sweetened, acidified, or used plain. They are also used locally in glysters; and the meal boiled with water into porridge forms an excellent suppurative poultice. Thomson's Lond. Disp.

OAT-Grass, in *Agriculture*, the name of a coarse sort of grass, that may perhaps sometimes be cultivated to advantage. See **AVENA**.

OAT-Snail. See **SNAIL**.

OATS, *Wild*, a species of this sort of grain, which is a weed, and difficult to be extirpated, where it has once taken possession; as ripening before harvest, and scattering its seed which remains in the ground till it is ploughed up again, though for a whole year or more, and will then come up with the corn. Some advise, as the surest way for destroying it, to lay the ground down to clover, and mow the oats and clover together before they are ripe.

OATARA, in *Geography*, one of the small Society islands, abounding with wood, S.E. of Ulitea.

OATES, **TIRUS**, in *Biography*, a very singular character, who flourished in the seventeenth century, was born about the year 1619. He was educated at Merchant-Tailors' school, from whence he removed to Cambridge. When he left the university, he obtained orders in the church of England, though in his youth he had been a member of a Baptist church in Virginia-street, Ratcliffe-Highway, and officiated some time as assistant to his father; he then held a vicarage in Kent, and afterwards in Sussex. In 1677 he became a convert to the church of Rome, and entered himself a member of the society of Jesuits. He is chiefly known as the informer of the Popish plot, of which a full account is given in Hume's History of England, vol. viii. ch. lxvii. For this pretended discovery he received a pension of 1200*l.* per annum, was lodged in Whitehall, and protected by the guards; but scarcely had king James ascended the throne, when he took ample revenge of the sufferings which his information had occasioned to the monarch's friends: he was thrown into prison, and tried for perjury with respect to what he had asserted as to that plot. Being convicted, he was sentenced to stand in the pillory five times a-year during his life, to be whipt from Aldgate to Newgate, and from thence to Tyburn, which sentence, says Neal, was exercised with a severity unknown to the English nation. "The impudence of the man," says the historian Hume, "supported itself under the conviction; and his courage under the punishment. He made solemn appeals to heaven, and protestations of the veracity of his testimony. Though the whipping was so cruel, that it was evidently the intention of the court to put him to death by that punishment, yet he was enabled by the care of his friends to recover, and he lived to king William's reign, when a pension of 400*l.* a-year was settled upon him. A considerable number of persons adhered to him in his distresses, and regarded him as a martyr to the Protestant cause." He was unquestionably a very infamous character, and those who regard the pretended Popish plot as a mere fiction, say that he contrived it out of revenge to the Jesuits, who had expelled him from their body. After having left the whole body of Dissenters for thirty years, he applied to be admitted again into the communion of the Baptists, having first returned to the church of England, and continued a member of it sixteen years. In 1698, or 1699, he was restored to his place among the Baptists, from whence he was

excluded in a few months as a disorderly person and a hypocrite: he died in the year 1705. He is described by Granger as a man "of cunning, mere effrontery, and the most consummate falsehood." And Hume describes him as "the most infamous of mankind; that in early life he had been chaplain to colonel Pride; was afterwards chaplain on board the fleet, whence he had been ignominiously dismissed on complaint of some unnatural practices: that he then became a convert to the Catholics; but that he afterwards boasted, that his conversion was a mere pretence, in order to get into their secrets and to betray them." Hume Hist. Toulmin's Edition of Neal, vol. iv. and v.

OATH, **JUSJURANDUM**, is usually defined a religious assertion or asseveration; wherein a person invokes the Almighty, renounces all claim to his mercy, or even calls for the divine vengeance upon himself, if he speak falsely.

Some civilians look on this definition as too lax, since it may agree to perjury; and would have this essential to an oath, that the thing affirmed be true. But this is arbitrary.

An oath is esteemed a kind of civil medium, between the person that gives it, and him to whom it is given; by which some controversy or other matter, which could not otherwise be determined, is brought to an issue. Its form, and the ceremonies with which it is attended, are arbitrary, and various in different countries.

The oaths we make to God are called *vows*, and in some cases *sacraments*.

OATH, in a legal sense, is a solemn action, whereby God is called to witness the truth of an affirmation given before one or more persons empowered to receive the same.

The forms of oaths, like other religious ceremonies, have been always various, but consisting, for the most part, of some bodily action, and of a prescribed form of words. Amongst the Jews, the juror held up his right hand towards heaven, which explains a passage in the 144th Psalm, "Whose mouth speaketh vanity, and *their right hand is a right hand of falsehood*." The same form is retained in Scotland still, amongst the same Jews. An oath of fidelity was taken, by the servant's putting his hand under the thigh of his lord (see Gen. xxiv. 2.); and hence, with no great variation, is perhaps derived the form of doing homage at this day, by putting the hands between the knees, and within the hands of the liege. Amongst the Greeks and Romans, the form varied with the subject and occasion of the oath. In private contracts, the parties took hold of each other's hand, whilst they swore to the performance; or they touched the altar of the god, by whose divinity they swore. Upon more solemn occasions it was the custom to slay a victim; and the beast being *struck down*, with certain ceremonies and invocations, gave birth to the expressions, *τεμενν ορκον*, *ferire pactum*, and to our English phrase, translated from these, of "striking a bargain." The forms of oaths in Christian countries are also very different; but in no country in the world, as archdeacon Paley believes, worse contrived, either to convey the meaning, or impress the obligation of an oath, than in our own. Legal oaths end with, "So help me God;" anciently with, "So help me God, at his holy dome, *i. e.* judgment." More frequently, the substance of the oath is repeated to the juror, by the person who administers it, adding in the conclusion, "So help you God." The energy of the sentence resides in the particle *so*; *so*, that is, *hac lege*, upon condition of my speaking the truth, or performing the promise, and not otherwise, "May God help me." The juror, whilst he hears or repeats the words of the oath, holds his right hand upon a bible, or other book, containing the four gospels. He then kisses the book;

book; the kifs being rather an act of reverence to the contents of the book, as, in the Papists' ritual, the priest kisses the gospel before he reads it, than any part of the oath.

This, according to our law-books, is called a *corporal oath*; because, as it has been commonly said, the party, when he swears, touches the gospels with his right hand. This opinion, however, says archdeacon Paley, appears to be a mistake: for the term is borrowed from the ancient usage of touching, upon these occasions, the *corporale*, or cloth which covered the consecrated elements.

But in some old customs of Anjou and Maine, it appears that *corporal* oath was anciently a simple affirmation, or vow of faith and fidelity, made by a vassal who has no liege, by lifting up his hand; in contradistinction to that made by a liege vassal, which was made by laying his hand on the gospel.

An oath is called *canonica purgatio*, because allowed of by the canons; to distinguish it from *vulgares purgationes*, viz. by battle, fire ordeal, &c. which the church always discouraged. In small matters, which the plaintiff could not prove, or, if he could, if his proof were set aside, the defendant might purge himself by his own oath: this was called *jurare propria manu*.

But in matters of more weight, he was to bring other credible persons, usually of the same quality with the plaintiff, to swear that they believed the defendant had sworn the truth.

These were called *compurgators*, or *sacramentales*; and their number was greater or less, according to the quality of the defendant, and the nature of the thing in question. Hence, *jurare duodecima manu*. See *COMPURGATORS*.

The obscure and elliptical form of an oath, above mentioned, together with the levity and frequency with which it is administered in our country, has occasioned a general inadvertency to the obligation of oaths, that is much to be lamented, both in a religious and political view; and it merits public consideration, says Paley, whether the requiring of oaths on so many frivolous occasions, especially in the customs, and in the qualifications for petty offices, has any other effect than to make them cheap in the minds of the people. This ingenious writer suggests, that the law may continue its own sanctions, without adding the solemnity of an oath: and where it is necessary, let it annex to prevarication penalties proportioned to the public consequence of the offence. Whatever be the form of an oath, the signification is the same. It is the calling upon God to witness, *i. e.* to take notice of what we say, and invoking his vengeance, or renouncing his favour, if what we say be false, or what we promise be not performed. The Quakers and Moravians refuse to swear upon any occasion; founding their scruples concerning the lawfulness of oaths upon our Saviour's prohibition, Matt. v. 34, "I say unto you, Swear not at all." In order to reconcile with this passage of scripture the practice of taking oaths, when required by law, the writer now cited suggests the following observations. It does not appear, that swearing "by heaven," "by the earth," "by Jerusalem," or "by their own head," was a form of swearing ever made use of amongst the Jews in judicial oaths; and, therefore, it is not probable, that our Saviour refers in the cases to which we have above alluded, to judicial oaths. As to the seeming universality of the prohibition, "Swear not at all," the emphatic clause "not at all" is to be read in connection with what follows, neither "by the heaven," nor "by the earth," &c. So that "not at all" does not mean

upon no occasion, but by none of these forms. When our Saviour himself was "abjured by the living God" to declare whether he was the Christ, the Son of God, or not, he condescended to answer the high-priest, without making any objection to the oath (for such it was) upon which he examined him. Besides, St. Paul, when he says to the Romans "God is my witness," and to the Corinthians, "I call God for a record upon my soul," uses expressions which contain the nature of oaths: and the epistle to the Hebrews speaks of the custom of swearing judicially, without censure or disapprobation: "Men verily swear by the greater, and an oath, for confirmation, is to them an end of all strife." Upon these grounds our Saviour's words are understood as relating, not to judicial oaths, but to the practice of vain, wanton, and unauthorized swearing, in common discourse. Our author further observes, that oaths are nugatory, or carry with them no force or obligation, unless we believe that God will punish false swearing with more severity than a simple lie or breach of promise. See *PERJURY*.

As oaths are designed for the security of the imposer, it is manifest they must be interpreted, and performed in the sense in which the imposer intends them; otherwise they afford no security to him: and this is the meaning and reason of the rule "*jurare in animum imponentis*." This rule our author applies to the explication of certain particular oaths, the nature and obligation of which he investigates.

In explaining the oath of allegiance, (see *ALLEGIANCE*.) he considers what it excludes and what it permits. It excludes all intention to support the claim or pretensions of any other person or persons, to the crown and government, than the reigning sovereign; and all design at the time, of deposing the reigning prince, for any reason whatever. It forbids the taking up of arms against such prince, with views of private advancement, or from motives of personal resentment or dislike. On the other hand, this oath permits resistance to the king, when his ill behaviour or imbecility is such as to make resistance beneficial to the community; and it does not require obedience to such commands of the king, as are unauthorized by law, nor that we should continue our allegiance to the king, after he is deposed, driven into exile, carried away captive, or otherwise rendered incapable of exercising the regal office, whether by his fault or without it. As to the oath against bribery in the election of members of Parliament, our author observes, that the several contrivances to evade this oath, such as the elector's accepting money under colour of borrowing, and giving a promissory note or other security for it, which is annulled after the election; receiving money from a stranger, or a person in disguise, or out of a drawer, or purse, left open for the purpose, or promises of money to be paid after the election; or stipulating for a place, living, or other private advantage of any kind; if they escape the moral penalties of perjury, they incur the moral guilt; for they are manifestly within the mischief and design of the statute which imposes the oath, and indeed within the terms of the oath itself. For the oath against simony, see *SIMONY*. Many oaths are imposed on members of colleges in the universities, and on other ancient foundations, requiring the observance of their respective statutes, which observance is become, in some cases, unlawful, in others impracticable, in others useless, in others inconvenient. The "*animus imponentis*," says our author, which is the measure of the juror's duty, seems to be satisfied, when nothing is omitted, but what, from some change in the circumstances under which it was prescribed, it may fairly be presumed that the

tion, in the snails and slugs, which destroy its leaf-buds, as soon as they appear.

OBAMA, in *Geography*, a town of Japan, in the island of Ximo; 25 miles E. of Nangafaki.

OBAMENE, a harbour on the east coast of the island of Otaha.

OBAN, a sea-port in the parish of Kilmore, and county of Argyle, Scotland, is situated on the shore of a fine bay, in the fount of Mull, and secured from the western ocean by the small island of Kerrara. This bay is of a semicircular form, and has two openings; one on the north, and another on the south. It is sufficiently extensive to afford anchorage for 500 sail of vessels, and is well defended from the western winds. To these favourable circumstances the town owes both its existence, and its rapid rise from a small beginning. The first house of any consequence was built about 50 years ago, by a trading company belonging to Renfrew, who used it for a store-room. The example being followed by other mercantile adventurers, Oban soon became a considerable place; and about ten years subsequent to its foundation, was made one of the ports belonging to the custom-house. The duke of Argyle, Mr. Campbell of Dunstaffnage, and other persons who possessed property around the new establishment, rightly judging that its prosperity would much enhance the value of their estates, gave every encouragement in their power to promote its increase, especially by granting building-leases upon the most liberal terms. It was particularly indebted to two brothers of the name of Stevenson, who settled in it in 1778; and by their industry and spirited exertions, not only accumulated handsome fortunes for themselves, but highly promoted the good of the neighbouring country. Oban is admirably adapted for trade, and is peculiarly well situated for a fishing station. These, however, are but inferior considerations to the great national benefits, which might be derived from its excellent harbour and road-head. It seems formed by nature, and a combination of many important advantages, to become the principal place of trade for the Highlands of Scotland, and the middle district of the western isles. Knox recommends this place to be made a royal dock and arsenal. There is a regular ferry from Oban to Kerrara island, and thence to Achnacraig, in the island of Mull; and by the formation of the canal between Loch-Gilp and Loch-Crinan, the navigation from this town to the Clyde has been rendered both direct, and free from the danger of the more circuitous passage round the Mull of Cantire.

In the immediate vicinity of Oban are immense rocks of breccia, or pudding-stone, composed of different forts and sizes of rounded pebbles. Some of the pebbles are quartzose, others porphyritic, granitic, schistous, and calcareous; and the whole are cemented together very firmly by a black lava. Other specimens of volcanic minerals are abundant in this neighbourhood. A few rocks of this sort are excavated to a vast depth, particularly one about half a mile south from the town. This indeed seems to indicate recent volcanic eruptions. According to the parliamentary returns of 1811, the parish of Kilmore, which is of small extent, contains 175 houses, and 821 inhabitants, who are chiefly resident in Oban. *Beauties of Scotland*, vol. v. Pennant's *Tour in Scotland*, 3 vols. 4to. Lond. 1790.

OBANA, in *Ancient Geography*, a town of Asia, in Assyria. Ptol.

OBARENI, a people who inhabit a considerable part of Armenia, near the river Cyrus.

OBBA, a town of Africa, in Mauritania Cæsariensis.

OBBEDIN, in *Geography*, a town of Walachia; 4 miles N.W. of Krajova.

OBDORSKOI, a town of Russia, in the government of Tobolsk, on the Oby, near its mouth, whither the Samiodes bring their tribute; 508 miles N. of Tobolsk. N. lat. 66° 10'. E. long. 67° 14'.

OBEAH, a superstitious practice, or a kind of sorcery or witchcraft, as the term imports, prevalent among the Negroes in Jamaica, and which has so powerful an effect as to bias, in a considerable degree, their general conduct, dispositions, and manners. Mr. B. Edwards has given a particular account of this practice, deduced from the researches and detail of Mr. Long. The term *obea*, *obiah*, or *obia*, is supposed to be the adjective, derived from the noun substantivative *obe*, or *obi*; and the words *obea*-man or woman denote those who practise *obi*. The etymology of this term is traced, by means of Mr. Bryant's Mythology, to *ob*, or *oub*, which, in the Egyptian language, signified a serpent. Moses, by divine authority, forbids the Israelites ever to inquire of the demon *Ob*, translated in our Bible charmer or wizard, divinator aut forcilegus; and the woman at Endor is called *Oub* or *Ob*, translated Puthonissa; and *Oubaios* was the name of the basilisk or royal serpent, emblem of the sun, and an ancient oracular deity of Africa. The term, supposed to be thus derived, is now generally used in Jamaica to denote those Africans who in that island practise witchcraft or sorcery, comprehending also the class of persons, called "Myal-men," or those who, by means of a narcotic potion, made with the juice of an herb, said to be a species of solanum, which occasions a trance or profound sleep of a certain duration, endeavour to convince the deluded spectators of their power to reanimate dead bodies. According to the result of the inquiries of the author now cited, the professors of *Obi* are, and always were, natives of Africa, and none other; and they have brought the science with them from thence to Jamaica, where it is so universally practised, that there are few of the large estates possessing native Africans, which have not one or more of them. The oldest and most crafty are those who usually attract the greatest devotion and confidence: besides the advantage derived from their hoary heads, and harsh forbidding aspect, they possess some skill in plants of the medicinal and poisonous species, which has qualified them for succeeding in their imposition on the weak and credulous. The Negroes in general, whether Africans or Creoles, revere, consult, and fear them. To these oracles they resort, with the most implicit faith, on all occasions, for the cure of disorders, the obtaining of revenge for injuries or insults, the conciliating of favour, the discovery and punishment of the thief or the adulterer, and the prediction of future events. The trade which these impostors carry on is extremely lucrative: they manufacture and sell their obies, adapted to different cases, and at different prices. A veil of mystery is studiously thrown over their incantations, to which they allot the midnight hours. The deluded Negroes, who are unsuspecting believers in their supernatural power, become voluntary accomplices in this concealment; and the stoutest of them tremble at the sight of the ragged bundle, the bottle, or the egg-shells, which are stuck in the thatch, or hung over the door of a hut, or upon the branch of a plantain-tree, to deter marauders. In cases of poison, the effects of it are by the ignorant Negroes ascribed wholly to the potent workings of *Obi*. When a negro is robbed of a fowl or a hog, he applies immediately to the obeah-man or woman: it is then made known among his fellow Blacks, that "*Obi* is set" for the thief; and as soon as the latter hears the dreadful news, his terrified imagination induces him to seek the only resource that is left in the superior skill of some more eminent obeah-man of the neighbourhood, who may counteract

counteract the magical operations of the other; but if no such person can be found, he falls into a decline under the incessant horror of impending calamities. The slightest painful sensation in the head, the bowels, or any other part, as well as any casual loss or hurt, confirms his apprehensions, and he believes himself to be the devoted victim of an invisible and irresistible agency. Sleep, appetite, and cheerfulness forsake him; his strength decays; his features assume the settled gloom of despondency; the most nauseous and unwholesome substance becomes his only food: he contracts a morbid habit of body, and gradually sinks into the grave. A Negro, who is taken ill, inquires of the obeah-man the cause of his sickness, whether it will prove mortal or not, and how long it will be before he either dies or recovers. The oracle generally ascribes the distemper to the malice of some particular person, and advises to set Obi for him; but if no hopes be given of recovery, immediate despair takes place, which no medicine can remove, and death is the certain consequence. As numerous occasions arise which provoke the Negroes to exercise the powers of Obi against each other, a considerable portion of the annual mortality amongst those of Jamaica is ascribed to this fascinating mischief. The Obi is usually composed of a farrago of materials, most of which are enumerated in the Jamaica law, passed in 1760, with a view to its suppression, *viz.* blood, feathers, parrots' beaks, dogs' teeth, alligators' teeth, broken bottles, grave-dirt, rum, and egg-shells. For a further account of this superstitious practice, see Edwards's *Hist. of the West Indies*, vol. ii.

OBED'S RIVER, in *Geography*, a river of America, in Tennessee, which runs south-west into Cumberland river, 290 miles from its mouth by the course of the stream. Cumberland river is thus far navigable for large vessels.

OBEDACH, or OBDACH, a town of the duchy of Stiria; 9 miles S.W. of Judenburg.

OBEDIENCE, OBEDIENTIA, is sometimes used, in the *Canon Law*, for an office, or the administration of it.

In our *Ancient Customs*, *obedientia* was used in the general for every thing that was enjoined the monks, by the abbot.

OBEDIENCE to Parents. See PARENT.

OBEDIENTIA, in a more restrained sense, was applied to the farm belonging to the abbey, to which the monks were sent *vi ejusdem obedientie*, either to look after the farm, or collect the rents. Hence, also, those rents themselves were called *obedientie*.

OBEDIA, in *Geography*, a town of Asiatic Turkey, in the province of Diarbekir, on the Khabur; 80 miles E. of Racca.

OBELIAS, among the ancients, a kind of small cakes, which were toasted on little spits, and served at table as a desert, to be eaten dipped in sweet wine, called *passum*.

OBELISCOTHECA, in *Botany*, so called by Vailant, on account of the quadrangular, and somewhat pyramidal, cases for the seeds, formed by the scales of the receptacle. See RUDBECKIA.

OBELISCUS MARMOREUS, in *Natural History*, the name of a very remarkable species of a shell-fish, unknown to us in its recent state, but met with very frequently fossil in the Swedish stone used for pavements, and some other kinds, and more accurately named by late authors *polythalamium*, and *orthoceratites*, and by Klein *tubulus marinus concameratus*.

OBELISK, OBELISCUS, a quadrangular pyramid, very slender, and high; raised as an ornament, in some public place, or to shew some stone of enormous size; and frequently charged with inscriptions, and hieroglyphics.

Borel derives the word from the Greek *obelos*, a spit,

broach, *spindle*, or even a kind of *long javelin*. Pliny says, the Egyptians cut their obelisks in form of sun-beams; and that in the Phœnician language, the word obelisk signifies *ray*.

The Egyptian priests called their obelisks the *'sun's fingers'*; because they served as styles, or gnomons, to mark the hours on the ground. The Arabs call them *Pharaoh's needles*: whence the Italians call them *aguglia*; and the English *Cleopatra's needles*. See CLEOPATRA'S NEEDLES and ALEXANDRIA.

The difference between obelisks and pyramids, according to some, consists in this, that the latter have large bases, and the former very small ones, compared with their height. Though Cardan makes the difference to consist in this, that obelisks are to be all of a piece, or consist of a single stone; and pyramids of several.

The proportions of the height and thickness are nearly the same in all obelisks; that is, their height is nine, or nine and a half, sometimes ten times their thickness; and their thickness, or diameter, at top, is never less than half, nor greater than three-fourths, of that at bottom.

This kind of monument appears to have been very ancient; and, we are told, was first made use of to transmit to posterity the principal precepts of philosophy, which were engraven on them in hieroglyphic characters. In after-times they were used to immortalize the actions of heroes, and the memory of persons beloved.

The first obelisk we know of was that raised by Rameses, king of Egypt, in the time of the Trojan war. It was 40 cubits high, and, according to Herodotus, employed 20,000 men in the building. Ptolemy, another king of Egypt, raised one of 45 cubits; and Ptolemy Philadelphus another of 88 cubits, in memory of Arsinoë. See PORPHYRY.

Augustus erected an obelisk at Rome, in the Campus Martius, which served to mark the hours on an horizontal dial, drawn on the pavement.

F. Kircher reckons up fourteen obelisks, celebrated above the rest; *viz.* that of Alexandria, that of the Barberins, those of Constantinople, of the Mons Esquilinus, of the Campus Flaminus of Florence, of Heliopolis, of Ludovico, of S. Mahut, of the Medici, of the Vatican, of M. Cælius, and that of Pamphylia.

One of the uses of obelisks among the ancients was to find the meridian altitudes of the sun, at different times of the year. Hence they served instead of very large gnomons. One of the obelisks now standing at Rome, that of St. John's Lateran, is in height 108 English feet, without the pedestal; and the other obelisk, brought to Rome by Augustus, buried under the Campus Martius, wants but little of the same height. Pliny gives us a description of this gnomon, lib. xxxvi. sect. 15. From him it appears, that there was laid down, from the foot of the obelisk northward, a level pavement of stone, equal in breadth to the breadth of the obelisk itself, and equal in length to its shadow at noon, upon the shortest day; that is to say, that its length was to the height of the obelisk, almost as 22 to 10, and that under this pavement, there were properly let in parallel rulers of brass, whose distance from the point, directly under the apex of the obelisk, were respectively equal to the length of the shadow thereof at noon, on the several days of the year, as the same lengths decreased from the shortest day to the longest, and again increased from the longest day to the shortest. Vide Phil. Trans. N^o 482. art. 5. vol. xlv. p. 365. where we also find some remarks by Mr. Folkes on Hardouin's Amendment of a Passage in Pliny's Natural History, lib. ii. sect. 74. Edit. Paris. 1723. fol. about the length of the

the shadows of gnomons in different latitudes. See Gnomon.

OBELISK, in *Grammar*, is a character in form of a dagger (†), serving to refer the reader to some note, or other matter, in the margin.

OBELUS, in *Antiquity*, denotes a little line or stroke, like a needle; whence its name *obelos*, which signifies *needle*. The word is chiefly used in speaking of Origen's Hexapla; wherein he distinguishes, with an asterisk or star, the supplements he makes to the texts of the Septuagint, where it falls short of the Hebrew meaning; and with an obelus or lineola (—), those places where the Septuagint had any thing not in the Hebrew.

St. Jerom says, the obelus was only used in those places where something was to be retrenched from the Septuagint, as superfluous, and the asterisk in those that were defective. These marks frequently occur in ancient manuscripts. Usually the obelus is accompanied with two dots, the one above, the other underneath, as (÷); and the asterisk is a St. Andrew's cross, cantoned with four points.

OBERBERG, in *Geography*, a town of Austria; six miles E.N.E. of Sleyregg.

OBER, a river which flows from a lake on the borders of Poland and Silesia, and runs into the Oder, four miles S. of Zulichan.

OBERBACH, a town of the duchy of Wurzburg; 10 miles N.W. of Kissingen.

OBERBERG, a bailiwick of Switzerland, belonging to the abbey of St. Gall.

OBERDORF, a town of Bavaria; 32 miles S. of Augs-burg.

OBERGESTLEN, a town of Switzerland, in the Valais; 48 miles E. of Sion.

OBERHAUSBERGEN, a town of France, in the department of the Lower Rhine, and chief place of a canton, in the district of Strasburg, three miles N.W. of it. The place contains 329, and the canton 11,720 inhabitants, on a territory of 120 kilometres, in 18 communes.

OBERINGELHEIM, a town of France, in the department of Mont Tonnerre, and chief place of a canton, in the district of Mayence. The place contains 1658, and the canton 10,623 inhabitants, in 18 communes.

OBERKIRCH, a town of the duchy of Baden; 12 miles E. of Strasburg. N. lat. 48° 33'. E. long. 8° 10'.

OBERKOTZAU, a town of Germany, in the principality of Bayreuth; 13 miles S. of Hof.

OBERLAND, a province of Prussia, formerly called "Hockerland," fertile and well cultivated. Before Prussia was invaded by the Teutonic knights, this province could furnish for the field 10,000 effective men, consisting of horse and foot; but as the inhabitants had exercised great cruelties towards the Christians, the Teutonic knights, in 1273, laid the country waste, and took possession of it.—Also, a territory in the duchy of Courland, lying between the town of Seelburg and Lithuania.

OBERMOSCHEL. See MOSCHEL.

OBERNAI, a town of France, in the department of the Lower Rhine, and chief place of a canton, in the district of Barr. The place contains 4391, and the canton 13,164 inhabitants, on a territory of 110 kilometres, in 11 communes.

OBERNBURG, a town of Germany, in the circle of the Lower Rhine; 16 miles E. of Darmstadt.

OBERNDORF, a town of Germany, in the county of Hohenberg, on the Neckar; eight miles E. of Schramberg.—Also, a town of Bavaria, in the bishopric of Bamberg; seven miles N. of Bamberg.—Also, a town of Germany,

in the county of Henneberg; eight miles S.E. of Meinungen.—Also, a town of Bavaria, on the Inn; 12 miles S.S.W. of Passau.

OBERNHAU, a town of Saxony, in the circle of Erzgebirg; six miles W. of Lauterstein.

OBERNKIRCHEN, a town of Austria; eight miles W. of Freytsadt.

OBERROSLA, a town of Germany, in the principality of Culmbach; 13 miles S. of Hof.

OBERSDORF, a town of Bohemia, in the circle of Chrudim; 14 miles E.N.E. of Leutmitschl.—Also, a town of Bavaria; 62 miles S. of Augsburg.

OBERSEE, a lake of Bavaria, one mile S. of Konigsee.—Also, a lake of Carinthia, one mile W. of Welach.

OBERSTADT, a town of Germany, in the county of Henneberg; seven miles E.N.E. of Meinungen.

OBERSTENFELD, a town of Wurtemberg; nine miles S.E. of Heilbronn.

OBERWALD, a town of Switzerland, in the Valais; 50 miles E. of Sion.

OBERWELS, or **OBERWOLTZ**, a town of the duchy of Stiria; 24 miles W. of Judenburg. N. lat. 47° 13'. E. long. 14°.

OBESITY, **OBESITAS**, in *Medicine*, the state of a person too much loaded with fat and flesh, otherwise called *corpulency*. See **CORPULENCE**.

OBEY, in the *Manege*. A horse is said to obey the hand and heels, to obey the aids or helps, when he knows and answers them according to demand.

OBIAN, in *Geography*, a navigable river of America, in Tennessee, which runs into the Mississippi, 70 yards broad, at the distance of 17 miles from its mouth.

OBIDOS, a town of Portugal, in Estremadura, seated on a river which runs into the Atlantic, and forms a bay at its mouth called "Lagoa de Obidos." The town is defended by a strong castle on a rock; 38 miles N. of Lisbon. N. lat. 39° 20'. W. long. 8° 59'.

OBJECT, derived from *obicere*, to set before, which is composed of *ob* and *jaceo*, I lie against, in *Philosophy*, something apprehended, or presented to the mind, by sensation, or by imagination.

An object is something that affects us by its presence, that moves the eye, ear, or some other of the organs of sense; or, at least, is represented to us by the imagination.

The school-philosophers define object to be that about which a power, act, or habit, is employed. Thus, good is the object of the will; truth of the understanding; so colour is the object of sight; sound, of hearing, &c.

Objects are usually divided into *next*, *proxima*, which are those on which the power or habit is immediately employed; in which sense colour is the next object of sight. And *remote*, which are those only perceived by means of the former: in which sense, the wall is the remote object of sight, since we only see it by means of its colour, &c.

Ideas are the immediate objects of the mind in thinking: bodies, their relations, attributes, &c. are the mediate objects.

Hence it appears, that there is a sort of subordination of objects. But note, that a next object, with regard to a remote one, is properly a subject, not an object.

They also distinguish objects *per se*, which are what properly move or affect our senses: these are the sensible qualities; and objects *per accidens*, which are substances, and only affect us by being invested with sensible qualities.

Again, they distinguish between *common* objects, which are such as affect divers senses; as are motion, figure, &c. and *proper* objects, which only affect one sense.

There

There are several conditions requisite to an object of *sense*; as, that it be material; that it be within a certain distance of a competent extent; its sensible qualities sufficiently intense, &c.

It is the object that reflects or emits the rays of light, which occasion vision. Objects, of themselves, are invisible; we only seem to perceive them, because the different texture of their surface, disposing them to reflect differently coloured rays, occasions in us several sensations of colour, which we attribute to them.

The objects of the eye, or vision, are painted on the retina; though not there erect, but inverted, according to the laws of optics. This is easily shewn, from Cartes's experiment of laying bare the vitreous humour on the back part of the eye, and putting over it a bit of white paper, or the skin of an egg, and then placing the fore-part of the eye to the hole of a darkened room. By this means is had a pretty landscape of the objects abroad, painted invertedly on the back of the eye.—How, in this case, the objects which are painted inverted should be seen erect, is matter of controversy. See *CAMERA Obscura*, and *VISION*.

OBJECT-glass of a telescope or microscope is the glass placed at the end of the tube which is next the object.

To prove the regularity and goodness of an object-glass, strike two concentric circles on paper, the one having its diameter the same with the breadth of the object-glass; the other half that diameter; divide the inner circumference into six equal parts; and making six fine small holes in it with a needle, cover one side of the glass with this paper; then exposing it to the sun, receive the rays that pass through these six holes on a plane, at a just distance from the glass; and, by withdrawing or approaching this plane, from or to the glass, we shall find whether the rays, that pass through these six holes, unite exactly together at any distance from the glass; if they do, we may be assured of the regularity of the glass, that is, of its just form; and, at the same time, we obtain exactly the glass's focal length.

Indeed, there is scarcely any better way of proving the excellency of an object-glass, than by placing it in a tube, and trying it with small eye-glasses, at several distant objects; for that object-glass which represents objects the brightest and most distinct, which bears the greatest aperture, and most convex and concave eye-glasses, without colouring or haziness, is always the best.

A circular object-glass is said to be truly centered, when the centre of its circumference is situated in the axis of the glass; and to be ill-centered, when the centre of its circumference lies beside the axis.

To prove whether object-glasses be well-centered, hold the glass at a due distance from the eye, and observe the two reflected images of a candle; where those images unite, or coalesce, there is the true centre. If this be in the middle, or central point of the glass, then it is known to be truly centered.

There are various methods of finding the true centre of an object-glass: the following was the method used by Mr. George Graham. Let a couple of short cylindrical tubes be turned in wood or brass, and let the convexity of the narrower be so exactly fitted to the concavity of the wider, as just to turn round in it with ease, but without waddling; and let the planes of the bases of the tubes be exactly perpendicular to their sides. Place the base of the narrower tube upon a smooth brass plate, or a wooden board, of an equal thickness, and with any sharp-pointed tool, describe a true circle upon the board round the outward circumference of the base; and upon the centre of this circle, to

be found when the tube is removed, describe a larger circle upon the board.

These two circles should be so proportioned, that the one may be somewhat greater, and the other somewhat smaller than any of the glasses intended to be centered by them. Then having cleared out all the wood within the inner circle, put the end of the tube into this hole, and there fasten it with glue, so that the base of the tube may lie in the surface of the board: then having fixed the wider tube very firmly, in a hole made in a window-shutter, and having darkened the room, lay the glass to be centered upon the board fixed to the narrower tube; and having placed the centre of it as near as you can guess over the centre of the hole, fix it to the board with two or three lumps of pitch, or soft cement, placed at its circumference. Then put the narrower tube into the wider as far as it can go, and fix up a smooth screen of white paper to receive the pictures of objects that lie before the window; and when they appear distinct upon the screen, let the inner tube be turned round upon its axis; and if the centre of the glass happens to be in this axis, the picture will be perfectly at rest upon the screen; if not, every point of it will describe a circle. With a pencil mark the highest and the lowest places of any one circle, described by some remarkable point in that part of the picture which appears most distinct; and when this point of the picture is brought to the highest mark, stop the circular motion of the tube, and keeping it in that position, depress the object-glass till the point aforesaid falls exactly in the middle between the two marks. Then turn the tube round again, and the point of the picture will either rest there, or will describe a much smaller circle than before, which must be reduced to a quiescent point by repeating the same operation. Then the centre (of refraction) of the glass will lie in the axis of the tube, and by consequence will be equidistant from the circumference of the large circle described upon the board fixed to it. Now, to describe a circle upon the glass *fgb*, (*Plate XV. Optics, fig. 19.*) about its centre of refraction, let a long slender brass plate *acb* be bent square at each end, as represented in the figure, leaving a piece in the middle, equal in length to the diameter of the large circle *adb*, that was described upon the board; and let the square ends of the plate be filed away, so as to leave a little round pin in the middle of each. Then having laid it over the glass, along any diameter of the large circle *adb*, make two holes in the board to receive the pins *a, b*; and find the centre of this circle upon the long plate; and with this centre, *c*, describe as large a circle as you can, upon the glass underneath, with a diamond-pointed compass; and grind away all the margin as far as this circle *fik*, in a deep tool for grinding eye-glasses; and then the glass will be truly centered. If the pitch, or cement, be too soft to keep the glass from slipping, while the circle is describing, it may be fixed firmer with wax, or harder cement. *Smith's Optics*, book iii. chap. 3.

Mr. Savery gives the following rule, which is very convenient for the use of the glass-grinder, and will enable him expeditiously to try whether a convex lens is well centered. Provide a round plate of brass (or hardened steel, if it can be prevented from rusting), conveniently thick, and well hardened by hammering, having many notches round it, one a little wider than the next, and numbered 1, 2, 3, &c. in their proper order, each of them being wider at the bottom than at the entrance. (*Plate XV. Optics, fig. 20.*) Fit one of these notches to the thickest side of the object-glasses, so that the edge may reach to about half its depth; and if the opposite side pass to the bottom of the notch, grind the lens narrower on the thinnest side, till you find it at that part

as thick as where you first tried it in the notch. After this manner reduce the glass to an equal thickness on its four quarters, and then grind off from other places what is needful to make it circular: let care be taken, when the lens is tried in the notch, that it be not warmer on one side than the other by grinding, but stay till it is quite cold; and observe likewise not to thrust it in harder on one side than on the opposite side. (Phil. Trans. vol. xlviii. p. 177, &c.) The chief advantage of having a glass well-centered is this, that the rays coming through any given hole or aperture, whose centre coincides with the axis of the glass, will form a more distinct image than if that centre lay beside the axis; because the aberrations of the rays from the geometrical focus of the pencil, are as the distances of their points of incidence from the centre of refractions in the glass.

As object-glasses are commonly included in cells that screw upon the end of the tube of a telescope, one may examine whether they be well-centered, by fixing the tube, and observing while the cell is unscrewed, whether the cross-hairs keep fixed upon the same lines of an object seen through a telescope. See CENTERING.

OBJECT is also used for the matter of an art or science; or that about which it is employed.

In which sense the word coincides with *subject*.

The school philosophers distinguish divers kind of objects in the same science; viz. *material*, which is the thing itself that is considered, or treated of; and thus it is the human body, which is the object of medicine: *formal*, which is the manner of considering it; and thus the same human body, considered with a view to the healing of it, is the *formal* object of medicine.

OBJECTION, in *Reasoning*, something urged to overthrow a position; or a difficulty raised against an allegation, or proposition, of a person with whom we are disputing.

The answering of objections comes under that branch of oratory, or that part of an oration, called *confirmation*, or *confutation*.

OBJECTION, *Over-ruling an*. See OVER-RULING.

OBJECTIVE, OBJECTIVUS, is used in the schools in speaking of a thing which exists no otherwise than as an object known.

The esse, or existence of such a thing, is said to be objective. Others call it *ratio objectiva*.

OBJECTIVE is also used for the power, or faculty, by which any thing becomes intelligible. And for the act itself, whereby any thing is presented to the mind, and known.

Hence a thing is said to *exist objectively*, *objectively*, when it exists no otherwise than in being known, or by being an object of the mind.

This some will have to be real esse; others deny it.

OBJECTIVE *Evidence*. See EVIDENCE.

OBJECTIVE *Line*. See LINE.

OBJECTIVE *Notion*. See NOTION.

OBJECTIVE *Plane*. See PLANE.

OBJECTUM *quod complexum*, of an art, is the aggregate whole, or a collection of all the objective conclusions, or consequences found in the science.

OBJECTUM *quod incomplexum*, is a collection of all the subjects of the objective conclusions. Thus, therefore, air, as elastic, is the *complex* object of one branch of physics; and air itself, or the subject of the conclusion, the *incomplex* object of the same branch.

OBJECTUM *quo complexum*, is a collection of all the objective antecedents of the science.

OBJECTUM *quo incomplexum*, is a collection of all the mediums, or arguments, contained in those antecedents, and whereby those conclusions are proved.

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In these cases, the object is said to be *complex*, inasmuch as it includes both an affirmation and negation; and *incomplex*, as it includes neither: *quod*, as being that which (*quod*) is shewn in the science; and *quo*, as being that whereby (*quo*) the conclusions therein are proved.

Schoolmen also distinguish other objects, which it is needless to mention.

OBIIT NUPER. See NUPER.

OBILA, in *Geography*, a province of the interior parts of Africa.

OBIONE, in *Botany*, Gærtner, v. 2. 198. t. 126, a genus formed by that author, of the Linnæan *Atriplex sibirica*, because its male flowers are four-cleft and tetrandrous, and, more especially, on account of the inverted position of the seed and its embryo. This plant is so perfectly an *Atriplex* in every other respect, that we presume to think the last-mentioned character is not always infallible any more than the others, at least when the embryo is circular.

OBIT, OBITUS, in our *Ancient Customs*, was a funeral solemnity, or office for the dead; commonly performed when the corpse lay uninterred in the church.

OBIT is also an anniversary office or mass, held yearly, in the Romish church, on a certain day, in memory of some person deceased.

One of the most ancient obits in Europe is that of king Childebert, founded in the abbey of St. Germain Desprez, and said on the eve of St. Thomas's day.

The tenure of obit, or chantry-lands, held of the subject by such service, is decreed to be extinct with us, by stat. 1 Edw. VI.

OBITEREA, in *Geography*, an island of the Pacific ocean, 100 leagues S. of the Society Islands. S. lat. 22° 40'. W. long. 150° 50'. This island has no good anchorage.

OBITUARY, OBITARUM, a funeral register, in which are written the names of the dead, and the days of their burial; for whom obits, or anniversaries, are to be performed.

These, in some places, are also called *mortuaries*; but more frequently *necrologies*, or *calendars*.

OBITUARY is more particularly used for a book containing the foundation or institution of the several obits in a church or monastery.

This is more frequently called the *Martyrology*.

OBLADA, in *Ichthyology*, a name given by some to the melanurus of authors, a fish of the sparus kind, distinguished by Artedi by the name of the sparus variegated with longitudinal lines, and with a large black spot on each side near the tail. See SPARUS *Melanurus*.

OBLATA, things given, or voluntarily offered, particularly to the king by any of his subjects.

They are thus called, because the oblata, or offerings to our kings, were so strictly looked to in the reigns of king John and Henry III., that they were entered in the fine-roll under the term oblata; and, if not paid, were put in charge to the sheriff.

OBLATA, in the *Exchequer*, signify old debts; brought, as it were, together, from preceding years, and put to the present sheriff's charge.

OBLATA is also a word used by some authors to express a sort of purging tablet, made of fine flour and sugar, with some purging ingredients.

OBLATE is also used to signify the consecrated wafers, or hosts, distributed to the communicants in the mass or sacrament of the altar; and sometimes the customary treats in religious houses have been called by the name of *oblata*.

OBLATI, anciently, were secular persons, who be-

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stowed

flowed themselves and their estates on some monastery, and were admitted as lay-brothers.

There were some of the oblati, properly called *donati*, who gave their persons, their families, and effects; and even entered into a kind of servitude themselves, and their descendants.

They were admitted by putting the bell-ropes of the church round their necks, and, as a mark of servitude, a few pence on their heads.

The *donati* took religious habits, but different from those of the monks.

In the archives of the abbey of St. Paul de Verdun is a permission given, in 1360, to a man of that abbey to marry a wife; on condition, that, of the children arising from the marriage, one-half should belong to the abbey, in quality of oblati; the other half to the bishop. This kind of oblati are said to have taken their first rise in the eleventh century.

In the earlier times, those only are called oblati, whom their parents engaged from their infancy to the monastic life. Those who embraced it themselves, when at an age capable of choice, were called *converts*, *conversi*.

The oblati made no profession; yet kept the celibate, lived in obedience to the superiors, and did the drudgery of the monastery: yet they differed from the servants of the house, who were allowed to marry.

The oblati and *donati* were, properly, servants by devotion, as the others were by condition.

Helyot says, the oblati differed from converts, inasmuch as the latter made the profession, and wore the habit, which the former did not.

OBLATI were also, in France, a kind of lay-monks, anciently placed by the king in all the abbeys and priories in his nomination; to whom the religious were obliged to give a monk's allowance, on account of their ringing the bells, and sweeping the church, and the court.

These offices were usually filled with lame soldiers, and invalids, some of whom had pensions on benefices, without any duty. But these oblati, with their pensions, have since been all removed to the hotel of the Invalids at Paris.

OBLATIONS, OFFERINGS, properly denote things offered to God.

In the canon law, oblations are defined to be any thing offered by godly Christians to God, and the church; *i. e.* to the priests, whether they be moveables, or immoveables.

Oblations, were anciently of various kinds, *viz.* *oblaciones altaris*, which the priests had for saying mass: *oblaciones defunctorum*, given by the last wills of the faithful to the church: *oblaciones mortuorum*, those given by the relations of the dead, at their burials: *oblaciones penitentium*, those given by penitents; and *oblaciones pentecostales*, or Whitsun-offerings.

Till the fourth century, the church had no fixed revenues, nor any other means of subsistence but alms, or voluntary oblations.

Under this term are now comprehended not only those small-customary sums commonly paid by every person, when he receives the sacrament of the Lord's Supper, at Easter, which in many places is *2d.* from every communicant, and in London *4d.* a house; though it does not appear on what their opinion of a groat a house for London is founded; but also the customary payments for marriages, christenings, churchings, and burials. The four offering days are Christmas, Easter, Whitsuntide, and the feast of the dedication of the parish church. It hath been decreed, with regard to Easter offerings, that they are due of common right, and not by custom only. Offerings may be recovered before the justices of the peace, by the small tythe act of 7 and 8 Will. cap. 6.

Offerings are made at the holy altar by the king and queen twelve times in the year on festivals called "Offering days," and distributed by the dean of the chapel to the poor. The money in lieu of these accustomed offerings is now fixed at 50 guineas a year, and paid by the privy purse annually to the dean or his order; for the distribution of which offertory money, the dean directs proper lists of poor people to be made out.

OBLAY, in *Geography*, a town of Lithuania, in the palatinate of Wilna; 12 miles S. of Braslau.

OBLIGATION, an act whereby a person engages, or binds himself, or is bound by another, to do something; as to pay a sum of money, to be surety, or the like.

The acceptance of a bill of exchange is a kind of obligation to pay it.

All obligations arise from contracts, or quasi-contracts; from crimes, or quasi-crimes; and, in the Roman law, were either civil, or prætorian; *i. e.* either approved by the civil law, or introduced by the prætor.

There are three kinds of obligations; *natural*, *civil*, and *mixt*.

Natural obligations are founded on the mere bond of natural equity, without any civil necessity, and without producing any action of constraint. Such are the obligations a minor is under.

Civil obligation is that supported by civil authority alone, and which induces a constraint, without any principle or foundation in natural equity. Such is the obligation on a man condemned unjustly.

Mixt obligation, or an obligation both natural and civil, is that which, being founded in natural equity, is farther confirmed and enforced by civil authority.

There are also *personal* obligations, *hypothecary* obligations, obligations of goods, body, &c.

OBLIGATION, in a more strict sense, denotes a bond containing a penalty, with a condition annexed, for payment of money at a certain time; or for performance of covenant, or the like. See BOND.

A bond, or obligation, is said to differ from a bill, in that the latter is commonly without a penalty, and without condition. Yet a bill may be obligatory. Coke on Littleton.

Till the Conquest, writings were rendered obligatory by certain marks of gold crosses, &c. The Normans first introduced the custom of making bills and obligations with a print or seal in wax, set to every one's signature, attested by three witnesses.

OBLIGATION, *Moral*, or *Obligation of virtue*, in *Ethics*. See *Moral PHILOSOPHY*, and *VIRTUE*.

OBLIGATO, in the *Italian Music*, signifies *for*, *on purpose for*, or *necessary*, as *doi violini obligato*, on purpose for two violins; and so of other things, as *con fagotto obligato*, that must be played with a bassoon, &c.

Sometimes it signifies confined, or restrained, by certain rules, subjected to certain limits or laws, in order to perform some particular thing, to give some particular expression of a passion, action, &c. In this sense we say, *contrapunto obligato*, *fuga obligata*, &c. We also say, the base is obligato, when it is only a ground of a certain number of bars, which are to be repeated over and over; such is the base to chaconnes, &c. and every base in which airs are confined to a certain series of notes often repeated to different trebles. See GROUND.

OBLIGE', Fr. OBLIGATO, Ital. the part of a composition said to be obligato, is in general the principal treble; but it is likewise applied to any part which cannot be omitted without injuring the harmony, melody, and design. What distinguishes

distinguishes it from all the other subordinate parts, that are only added to enrich the harmony, is, that if retrenched, the piece will be mutilated. Those who perform the ripieno parts, may stop whenever they please, and the piece nevertheless will go on; but the performer to whom an obligato part is assigned, cannot stop a moment without being missed.

OBLIGEE, in *Law*, is the party to whom an obligation, or bond is made.

OBLIGOR, the party who enters into or executes an obligation, or bond.

OBLIQUATION, in *Catoptrics*. *Cathetus of obliquation* is a right line drawn perpendicular to a mirror, in the point of incidence, or reflection of a ray. See **CATHETUS**.

OBLIQUE, in *Geometry*, something aslant, indirect, or that deviates from the perpendicular.

OBLIQUE Angle. See **ANGLE**.

OBLIQUE-Angled Triangle, is that whose angles are oblique; *i. e.* either obtuse, or acute.

OBLIQUE Arches. Whenever high roads run oblique to the course of any river, rivulet, drain, or canal, necessary to be passed over by a bridge, the direction of the former is generally varied so as to be rectangular to the course of the latter; unless in small streams, over which, when their course is not made to suit the road, there are several instances of the construction of what are usually termed *skew-bridges*. These, with the exceptions which will be afterwards mentioned, have been built in the usual manner of laying each course of stones or bricks of the arch parallel to the line of the abutment, and bevelling off their ends, on each exterior face of the arch, in a line correspondent with the intended direction of the road over the bridge, as shewn in *fig. 1*. In this figure it is obvious, that so far as one abutment of the bridge extends beyond the rectangular line from the extremity of the other, such a portion of arch, *viz. a b*, has no support from the opposite abutment, unless what may be derived from the interlapping or breaking joint of the bricks or stones composing the arch; and from the goodness of the mortar, tending to cement them into one mass: therefore, accordingly as these circumstances have operated, and also in proportion to the smallness of the arch, in which the parapet covers a larger ratio of the unsupported part of it, the skew-bridges thus built have stood more or less firm, with an obliquity of 10° to 15° from a rectangle with the abutment; and in many instances, that portion of the arch has cracked or given way. These circumstances have prevented cautious builders from adopting this method; and induced them, in a few instances, to build the arch square to its abutments, and run the parapets oblique, to coincide with the line of road; leaving alternate triangles of the arch on the outside, which has a disagreeable appearance, and has seldom been used; therefore, in general, unless the courses of streams or canals were made rectangular to the road, the line of the latter has been altered so as to admit of a direct passage over the water, which upon high roads, when not curved for a considerable distance, is inconvenient if not dangerous; and particularly so to travellers in the night time; from which cause the skew-bridges described were, with all their imperfections, occasionally had recourse to; and the writer of this article has never heard of any alteration in their form prior to the year 1787. At this time he had the direction of the county of Kildare canal, a branch from the Grand Canal of Ireland to the town of Naas.

In the course of conducting the work, several of the directors of that canal were anxious to have the line of the roads unvaried; therefore our author was led to consider whether the usual imperfect method could not be set aside, by the substitution

of one on sound principles; and it then occurred that its leading feature must be, that the joints of the voissiors, whether of brick or stone, should be rectangular with the face of the oblique arch, in place of parallel with its abutment; and, consequently, the bridges over the county of Kildare canal were made to suit the line of road, although the obliquity of one of them was carried to an extent beyond what he deemed eligible in practice, as will appear from the observations made on Finlay bridge, near the town of Naas, which deviated 51° from a rectangle with the canal, and consequently formed the acute angle of 39° with its abutments. Its span, in that oblique direction, was 25 feet, and its pitch 5 feet 6 inches, or nearly $\frac{1}{3}$ ths of its span. The plan of this bridge is given in *fig. 2*, and in *fig. 3*. the elevation of its arch, more to shew the extent to which it has been carried than to recommend its propriety; principally because of the difficulty of forming the voissiors of the impost course; and also, because to retain the same breadth of roadway, the bridge must be enlarged as the secant of the angle of obliquity is to radius, *viz.* as *a b* to *a c*, which in the present instance is as 159° to 100° ; likewise, for general purposes, one breast-wall on each side must be considerably extended to coincide with its opposite one, or nearly so; also, the impost course must be serrated, as shewn in the explanation of *fig. 8*; and as the lines, in which the beds of the voissiors run, are obviously spiral lines, it follows that the soffit of each stone must be curved in that direction, and likewise it must be twisted in its forming, which, although not insuperable difficulties, are so in such a degree, as, combined with the indented form of the impost, to render it advisable to use bricks, both for the impost and arch, or at most to be contented with the use of stone only for the quoins and their necessary imposts, in the forming of which intelligent stone-cutters will be requisite, as will appear from *fig. 3*, where a part both of the intrados and extrados of the arch is shewn as viewed from an infinite distance, not being reduced in perspective. It is there apparent that the head of each voissior on that side of the arch where its face forms an acute angle with its abutment, must make an obtuse angle with its soffit, decreasing in their approach to the crown of the arch, and thenceforward becoming acute, and increasing as they advance to the other impost, where the face of the arch forms an obtuse angle with its abutment; therefore the different sides of the same voissior must form different angles of elevation or depression from the rectangle with its head.

A geometric mode of forming each voissior would be complicated, as will appear from the following diagrams, *viz.* let the lines *a b*, *b d*, and *d c*, in the diagram, *fig. 4*, include a portion of the space to be covered by the arch, *a b* and *ed* being the lines of its abutments: then let the distance intercepted between *d b*, and its parallel line *x y*, which likewise extends between the abutments, express the extent to be covered by any given number of the voissiors forming the portion of the soffit, suppose every alternate one:—let the circular arcs raised upon each of these lines express the elevation of the arch at each place respectively; *u* and *v* will then shew the crowns of their soffits. The line *t t*, drawn at right angles with the face of the arch, and with its respective extremities equidistant from the points *u* and *v*, will represent a joint on the soffit, which must necessarily be horizontal at its extremities; because equidistant from the crown of each arch, although on alternate sides; then if equal spaces on each side of the point *t*, be set off on each respective arc, it will shew upon each where the joints of the same voissiors will coincide. Four of these spaces in the

OBLIQUE ARCHES.

arc $du b$, which represents the front of the arch, reach from t to d , viz. to the abutment on the side, where it forms an obtuse angle with that front, whilst the same number of similar spaces in the like direction extend only from t to 4 , in the arc $xv y$, representing the internal end or extreme extent of the voissairs seen on the face of the arch. The same circumstances are reversed on the side where the front forms an acute angle with the abutment, as shewn by the similar references on the other side of tt : consequently the joint 4 , in front of the arch, will fall into the impost at y on the rear line. The radiating lines rising above each arc, drawn from their respective centres b and g , shew the twist or different sommering lines at each extremity of the same joint: the difference of these divergencies would be more clearly seen by exhibiting similar lines upon the arc $rv s$, which represents that of $xv y$, upon the same level as the front arc $du b$, preserving an equal lateral distance between them, which as it may be easily conceived is left undone, because they would interfere with the lines requisite for the further explanation of the subject. The points, r and s , upon the last described arc, correspond with x and y upon that for which it is substituted, every remaining letter or figure of reference being the same in both.

The vertical spaces on the acute side of the arch intercepted between $4 s$, $3 3$, &c. until they become horizontal at t , shew the proportionate depression of the soffit of the joints they represent; and on the other side, d to 4 , on the lower dotted arc; $3 3$, &c. shew the rise on each voissair abutting on these points. The horizontal base between the extremities of each joint is shewn by the lines dn , zm , kl , &c. which extend between the chords db and xy , from the points found by the intersection of the ordinates from the correspondent numbers of their respective curves. The horizontal base, kl , is the only one that is rectangular to the chord of the arc; all the other bases diverging towards that abutment which forms an obtuse angle with the arch, and increasing towards the haunches. At the first view of the diagram they appear to diverge both ways, but on investigation it will be seen that the letter n , on the side of the acute angle, has reference to the front arc, and on the other side refers to that representing the inner end of each joint. From these data we shall proceed to shew the longitudinal section or side elevation of a voissair at tt , and other parts of the arch: kl , fig. 5, correspondent with kl , fig. 4. but on a larger scale, expresses the base of the voissair, and k , its height of face, or its width of bed; which latter may be assumed to be similar in the others, viz. di , fig. 6. and $4 i$, fig. 7. The rise of the curve in the soffit between k and k , must obviously be equal to the difference between the ordinates tk and ue , fig. 4, because the crown of the arch shewn by the line du , must be intersected at half-way between t , t , the extremes of the voissair; one end of the stone being on that side of the crown descending to the left, and the other extremity equidistant on the side descending to the right. The breast-wall is shewn rising rectangular from this voissair. Fig. 6. upon the principles already explained, shews on the side where the front line of the arch makes an obtuse angle with its abutment, the voissair rising from the springing point at d to 4 , on the posterior arc which corresponds with its inner extremity; and fig. 7. exhibits, on the side where the front is acute with its abutment, the bed of a voissair commencing at 4 , on the front arc $du b$, and descending to the abutment at s , on the arc representing the outer extremity. By these diagrams it appears, that under equal widths of bed the space between the intrados and extrados increases upon the face of the arch as the haunches

of the arch are approached: therefore the rough blocks for the voissairs must be increased in their breadth of face to allow for the further divergency of their sommering lines, arising from their height of face, or difference between intrados and extrados, being increased as the secants of their angles of deviation from a rectangle with a line between each extremity of their soffit: viz. as dz is to di , fig. 6, or $4 r$ to $4 i$ in fig. 7. And if the twist of the sommering lines be attended to, the long voissairs must have a still greater width of block between their beds than the short ones: therefore, previously to the fitting each stone to its individual place, as the work advances nothing more can easily be done than giving due allowance to the first of these variations, which will be sufficient in practice where the arch, excepting its quoins, is formed of brick; because the facility of making the brick sheeting break joint with the stone voissairs of the face, will render it unnecessary to twist the beds of the latter, and with the precaution mentioned, and the necessary aid of a bevil rule with a moveable joint, and its long arm formed of short jointed links to suit the curve of the soffit, in the direction of each stone and towards the haunches on each joint of it, the operations of fitting each voissair to its place will not be difficult.

Fig. 6. sufficiently shews the danger of the breast or face-wall sliding outwards on the acute angles of the soffit; therefore, when the obliquity of the arch is carried near to that of Finlay bridge, which these diagrams represent, either the breast-wall should be curved, where it forms an obtuse angle with the abutment, or the voissair should have offsets, which may be of the breadth of a brick, if the wall be built of that material, to form a stop to its slipping forward, as shewn by the dotted lines under it in fig. 6.

We shall now point out some anomalies from the leading principle which are necessary to be adverted to, for a due knowledge of the mode of constructing oblique bridges.

A semicircular arch obviously covers a semi-cylinder; and a lesser portion of the arc of a circle will consequently cover a similar portion of it. If it be supposed, in either instance, that the cylindric segment, lying horizontally on its plane, with its axis in the direction of its abutments, is longer than necessary for the road-way over it, in any given oblique direction; we then, to obtain an oblique arch, have only to conceive the convex face of the cylindric segment to be cut down between two parallel vertical planes, in the direction required. But this arch, from the nature of cylindric sections, will be elliptic; which is not so eligible in practice, because of its quicker rise at the haunches of the arch, the inconveniencies of which have already been explained; and they obviously militate not only against the elliptic form, but also any near approach to a semicircle.

We have observed that the leading principle of these oblique arches is, that each course of voissair should run rectangular to the face of the arch. This, however, must be taken in a limited sense; because if the sheeting, or bed of the arch, were unfolded, or laid into a plane, its faces on the two extremities, bounding the passage over it, would not be straight lines parallel to each other, like the parapet walls; but would form two curved lines, each convex where the line of the arch is acute with the abutment, and concave when it approaches the other side where the intercepted angle is obtuse. This irregularity necessarily arises from the circumstance, that each front line of the sheeting, mgp , and nhq , fig. 8, in its course from the crown of the arch, in a direction oblique to gb , (the axis of the vault transverse to the abutments,) must not, in its spiral gyration along the surface of the cylindric segment on each side of

OBLIQUE ARCHES.

g b, advance through equal ratios of the axis, in equal portions of the arc, but simply as the respective horizontal bases of these portions: therefore its deviation from a line rectangular with the axis becomes progressively less in its approach to each abutment.

The greater or less curvature of the two faces of the arch, when drawn out as a plane, must depend on the greater or less pitch of the arch, as shewn in *fig. 8*; where *r s* and *t d* are the abutments of the bridge, and, consequently, *r s d t* the base of the arch. The angle of obliquity is here 51° , as in the preceding diagram: the line *g b* passes along the crown of it; and the curved lines, *g m* and *b n*, terminated by the line *m n*, exhibit half the arch of Finlay bridge, drawn out as a horizontal plane; *m n* and *t d* being parallel to, and rectangular from each other; and their distances from the crown of the arch, *g b*, in their respective lines, *g m*, *b n*, and *g t*, *b d*, being in one the length of the semi-arc, and the other that of its base. On the other side of the line *g b*, the curved lines, *g p* and *b q*, connected by the right line *p q*, shew the form of half a semicircular arch of the same base, drawn out into a plane. In both exhibitions, it is clear that lines drawn perpendicular to different parts of the face of the arch, to serve as guide-lines to the joints of the soffit, would in one part converge to each other, and form triangles; and in the other part, where the face-line extended on a plane is concave, would diverge, so as, in both instances, to occasion great irregularity and difficulty in closing of the arch; which actually takes place in practice, unless due attention be paid to its leading principles, which have been pointed out in the explanation of *fig. 4*, so far as that diagram enabled them to be; which, although not to the extent requisite for the construction of the arch, may be made perfectly comprehensible to any practical man, by attention to the following instructions, *viz.* after the centres, which are placed parallel to the face of the arch, and diagonally to its abutment, are put up, and covered with their plank-sheeting, carefully set off their bounding-lines, *m p* and *q n*, as in any other arch; so that every part of these face-lines shall be perpendicular to, or directly under, a horizontal line stretched from *r* to *t*, or from *s* to *d*, upon the level of the crown of the arch. Then, equidistant from each abutment, *viz.* along the crown of the arch, strike the line *g b*, which will of course be a straight line. Divide it into any given number of equal parts: if very oblique, ten or twelve may be sufficient; and in arches of small obliquity, a few divisions will do. The present diagram (*fig. 8*.) is more oblique than will probably be adopted; but the scale being minute, the line *g b* is divided into only six parts, as the purpose of explanation will be equally well attained.

The figures 1, 2, 3, &c. in succession from *b* to *g*, shew the divisions on that line; and *a*, *b*, *c*, &c. exhibit correspondent spaces close to each abutment. These divisions being made, set out, on the sheeting, so many parallel lines to the outer faces, *m g p*, and *n b q*, *viz.* *a 1 a*, *b 2 b*, &c.: *k 1* represents a line of joint near the crown of the arch, and rectangular to its face; which commencing at the distance of *b k*, will intersect *b g*, the line of the crown, at the distance of *b 1*, from the face of the arch; and will represent half the line, *t t*, in diagram, *fig. 4*.

By the theory laid down for these arches, the joints on their soffit are to run parallel to each other; or rather they are to intersect equal portions of parallel equidistant arcs, standing in a line oblique to their common axis. This end may obviously be obtained, by setting off on each face of the arch, and on each of the parallel equidistant lines, *a 1 a*, *b 2 b*, &c. spaces similar to *b k*, in succession after each

other from the points *b 1*, 2, 3, 4, 5, and *g*, towards each abutment; and then to mark upon the sheeting strong lines, to direct the course of the joints, such as shewn by *k 1*, *1 u*, *u v*, &c. which will form a polygonic curve, more or less approaching to a regular curve, according to the obliquity of the arch, and its approximation to a semicircle, and the number of divisions between *b* and *g*. The horizontal bases of the soffit joints near the abutments, on each side of the arch, are, as shewn in *fig. 4*, inclined from the line of the face towards that abutment which forms with it an *obtuse* internal angle: notwithstanding which, these joints, when drawn on the plane of the sheeting, deviate from the rectangle, with its face line towards the abutment which forms an *acute* internal angle with the line of the arch, and from the abutment on the opposite side, as shewn by those lines in *fig. 8*.

These eccentricities, although they render it difficult to form all the voissiors prior to the commencement of the arch, are easily got over by forming them in succession, as described.

As the lines, *a 1 a*, *b 2 b*, &c. over the curve of the arch will be rather troublesome to form correctly, the best mode in practice will be to mark off on each face, and each side of the arch, a continuation of the spaces, *q i* and *b k*, towards each abutment. Then as the progressive correspondent points from *g* and *b*, *viz.* *i f*, *o l*, &c. will have right lines between them, straight chalk-lines can easily be struck; and when the spaces, *b 1*, *b 2*, &c. are set off upon each of them, the intersecting points similar to *u*, *v*, *x*, &c. will be found the same as upon the lines *a 1 a*, *b 2 b*, which, therefore, have no occasion to be formed.

Had the number of divisions on the line *b q* been greater, the curvature of the joint lines would have appeared more material on that side of the diagram, exhibiting a semicircular arch expanded; but on the other side, where the arch is of the flat pitch described, but with great obliquity, the deviation from right lines is so much less so, that in brickwork the joint-lines may easily be followed. In similar arcs of moderate obliquity, the divergency is of course less; but yet it will, unless the arch approach within about 20° of a rectangle with its abutments, be sufficient to occasion considerable irregularity, if the joint-lines be continued across, rectangular from either face.

We had frequent opportunities of seeing, for several years after it was built, the bridge from which most of the diagrams have been drawn, and never observed any crack in it; but yet from the uncertainty of obtaining careful and intelligent overseers, and good materials, and likewise because of the greater expence, and not having investigated the subject in all its bearings, so as to lay down sufficiently plain instructions, we did not then, in several bridges over the Grand Canal of Ireland, which we directed to be built obliquely, and in other bridges, subsequently, over wide drains in the East Riding of Yorkshire, venture to exceed 40° of obliquity, and rarely 30° , although the angle of intersection of the road and water was generally more considerable. It is clearly evident that this extent of angle would often be highly useful, as it would rarely leave much to be made up by the deviation of the road from its usual direction. The wing-walls of Finlay bridge were curved one more than the other on the same side, to give a passage along each bank of the canal; but where not over a canal, if the line of direction of the road coincide with that of the bridge, the wing-walls may terminate more nearly square with the road, or completely so, as in *fig. 9*, which shews one of these bridges under an obliquity of about 40° , with the arch unclosed, so as to shew the wood sheeting supporting it,

it, and the mode of closing it without unequal pressure on each side of the centres.

From what has already been explained, it necessarily follows that each impost of the arch, in place of being simply hommered to the radiating line of the incumbent curve, must also, as appears in *fig. 3*, be ferrated (as shewn between *e* and *c*, *fig. 8*.) to suit the adjoining bed of the stones, or bricks, forming the arch.

The casual utility of these arches is obvious, and the theoretic and practical mode of forming them has been explained to such extent, as to make the process easy to any intelligent mason. Since the period we have mentioned, the plan has in a few instances been followed; and the same idea may have occurred to others, although we have never heard of it.

The principal use of these bridges will be where lines of projected canals intersect high roads with obliquity; in which case, the road, if curved for a sufficient extent to fall in with a rectangular passage over the canal in so gentle a manner as it ought, would require a considerable length of double curve, *viz.* alternately outwards and inwards on one side, or both, accordingly as the bridge might be placed, an instance of the latter of which is shewn in sketch N^o 10. Under this predicament, where the land is valuable, or houses interfere to interrupt the change of road, it may often be found advantageous, because more economical to incur the increase of expence attendant on the construction of an oblique bridge; which, under moderate angles of departure from the right line across, is not very material; and where it becomes so, will sometimes be greatly inferior to the advantages acquired by it. We have been indebted for the preceding article to — Chapman, *esq.* a well-known and ingenious engineer, to whom we have already referred under the article CANAL.

OBLIQUE Circle, in the stereographical projection of the sphere, any circle that is oblique to the plane of projection.

OBLIQUE Leaf, in *Botany*, is so twisted, that one part becomes vertical, while the other is horizontal. The term *obliquum* is sometimes, less correctly, applied to a leaf unequal at the base, or sides, as in *Begonia* and *Eucalyptus*; in both which it was unfortunately chosen for a specific name, being afterwards necessarily changed, when the character proved common to almost every species of those now numerous genera.

OBLIQUE Line, a line which, falling on another, makes an oblique angle.

A line falling obliquely on another makes the angle on one side obtuse, and that on the other acute.

OBLIQUE Percussion, is that wherein the direction of the striking body is not perpendicular to the body struck, or is not in a line with its centre of gravity. See PERCUSSION.

The ratio an oblique stroke bears to a perpendicular one, is demonstrated to be as the sine of the angle of incidence to the radius.

OBLIQUE Planes, in *Dialling*, are such as recline from the zenith, or incline towards the horizon.

The obliquity, or quantity of this inclination, or reclinatation, is easily found by a quadrant; it being an arc of some azimuth, or vertical circle, intercepted between the vertex of the place and of that plane. This azimuth, or vertical circle, is always perpendicular to the plane. See DIALLING.

OBLIQUE Powers or Forces. See MOTION, DIRECTION, &c.

OBLIQUE Projection, in *Mechanics*, is that where a body is impelled in a line of direction, which make an oblique angle with the horizontal line. See PROJECTION.

OBLIQUE Sailing, in *Navigation*, is when the ship, being in some intermediate rhumb between the four cardinal points, makes an oblique angle with the meridian, and continually changes both its latitude and longitude.

Oblique sailing is of three kinds; *viz.* *plain sailing*, *Mercator's sailing*, and *great circle sailing*. See SAILING.

The seamen also call the application of the method of calculating the parts of oblique plain triangles, in order to find the distance of a ship from any cape, head-land, &c. by the name of oblique sailing.

OBLIQUE Sphere, in *Geography*, is that whose horizon cuts the equator obliquely; and one of whose poles is raised above the horizon, by an elevation equal to the latitude of the place.

It is this obliquity that occasions the inequality of days and nights.

Those who live under an oblique sphere (as we, and all those in the temperate zone, do) never have their days and equal, except in the equinoxes.

OBLIQUE Ascension, in *Astronomy*. See ASCENSION.

OBLIQUE Descension. See DESCENSION.

To find the oblique ascension and descension by the globe, see GLOBE.

OBLIQUE Cases, in *Grammar*, are all the cases of the declensions of nouns, besides the nominative. See CASE.

OBLIQUE Distillery, in *Chemistry*. See DISTILLATION.

OBLIQUE Flanks, in *Fortification*. See FLANK.

OBLIQUITY, that which denotes a thing *oblique*.

The obliquity of the sphere is the cause of the inequality of the seasons of nights and days.

OBLIQUITY of the Ecliptic, is the angle which the ecliptic makes with the equator. See ECLIPTIC.

OBLIQUO, in the *Italian Music*, signifies two breves tied together, which make but one body, whence it is named in Italian *nota d'un corpo solo*; sometimes there is a tail, on the right or left side, either ascending or descending. (See NOTE and LIGATURE.) However it be, the two extremes mark the sound, the middle serves only to tie them, thus:



OBLIQUUS, in *Anatomy*, an epithet applied to several muscles of the human body.

The *obliqui abdominis* are two large muscles of the abdomen. As the muscles of this part are much connected together, and cannot be well understood, when described in an insulated way, we shall give an account of the whole in this article.

The sides or parietes of the abdominal cavity are composed almost entirely of muscles: the diaphragm separates it above from the chest, (see DIAPHRAGM,) and the levator ani shuts it up below (see INTESTINE). At the front and sides its boundaries are formed by the *abdominal* muscles properly so called, which fill up all the space between the inferior aperture of the chest and the superior margin of the pelvis. The contractions of these muscles change the dimensions and form of the abdomen, move the viscera in different directions, and execute many of the movements of the trunk. The details concerning these points will be found in the present article, in those just referred to, and in the article LUNGS.

The abdominal muscles are five on each side of the body: three of these are very broad, and placed in succession, one within the other, at the side of the abdomen. They end, in front, in broad and thin aponeuroses or sheets of tendon, which occupy all the front of the trunk between the chest and pelvis. The formation of these muscles is therefore peculiar, and the peculiarity arises from their being placed on

OBLIQUUS.

the surface of a cavity, and having an expansion in breadth necessary to cover that cavity. Their aponeuroses form a firm support and protection to the contained viscera. In tracing the aponeuroses of the three lateral muscles from the side, towards the middle of the abdomen, we find them separating from each other, so as to form a tendinous sheath, disposed lengthwise on the front of the abdomen, and including the *rectus* and *pyramidalis abdominis*; they then unite again, and are firmly interwoven, along the middle line of the abdomen, with those of the opposite side, to form the *linea alba*, which is consequently a common point of insertion for the three broad muscles of each side.

When the integuments are stripped from the front of the belly, the exposed surface is entirely aponeurotic, between two perpendicular lines, drawn from the anterior superior spines of the *os innominata* to the corresponding points of the chest. The *linea alba* is a white depressed line, running perpendicularly along the middle of the belly, from the ensiform cartilage to the pubes, and separating from each other the right and left *recti* and *pyramidales*. It is made up of tendinous fibres, closely compacted, and interwoven with each other. It is fixed above to the ensiform cartilage, below to the symphysis pubis; its anterior surface is covered by the skin, the posterior by the peritoneum. Its sides are the points of attachment of the broad muscles of the abdomen. A little below its middle, there is a round opening in it, called the navel or umbilicus. Through this the vessels of the umbilical chord pass in the fœtus, and the fibrous remains of the same vessels occupy it after the chord has been separated. The aperture is larger at the former period: it gradually diminishes in size after birth, and is filled by a dense substance with the remains of the vessels already mentioned, to which an inflected cicatrix of the skin firmly adheres. In umbilical ruptures the contents of the abdomen are generally protruded at this opening. The *linea alba* varies in breadth at different parts. At the ensiform cartilage the *recti* nearly touch each other: but they diverge below this point, so that the line is about half or three quarters of an inch broad at the navel. It again grows narrower below the navel, and is a mere line for some inches above the pubes.

On each side of the *linea alba* the aponeurosis is elevated by the *recti* muscles; and a femoral line is described by the outer margin of each of these, where the aponeuroses separate, in order to include the *rectus*: hence arise the two *lineæ feminales* of the abdomen, the right and left. There are three or four shorter lines placed transversely, and crossing from the *linea alba* to the semilunar on each side: they are formed by the adhesion of the aponeurosis to the tendinous intersections of the *recti*, and are sometimes called *lineæ transversæ*.

The *obliquus externus abdominis* (*obliquus descendens*, grand oblique, costo-abdominal) is the largest and most superficial of the abdominal muscles, of inconsiderable thickness in comparison to its breadth. It extends from the lower and anterior part of the chest to the crista of the ilium, and to the pubes; and from the lumbar region behind to the *linea alba* in front. We consider in it an external and an internal surface, and four edges.

The external surface is covered by the skin, except for a small extent behind, where the *latissimus dorsi* lies on it: a considerable stratum of fat lies between the integuments and this muscle. The internal surface covers the anterior part of the seven or eight lower ribs, and of their cartilages, the intercostal muscles, the upper part of the *rectus*, the *obliquus internus*, the cremaster muscle and spermatic chord. A thin stratum of cellular tissue separates it from the *obliquus internus* behind; but in front the aponeuroses are

blended into one layer in the greatest part of their breadth.

The front edge of the aponeurosis is attached to the *linea alba* in its whole length: the posterior margin of the muscle is extended from the cartilage of the last false rib to the crista ilii, and is unattached: it is covered by the *latissimus dorsi*.

The superior edge may be divided into two parts: the anterior, which is short, extends horizontally from the seventh or eighth rib to the middle of the ensiform cartilage, and is covered by and connected to the *pectoralis major*; the posterior is much longer, directed obliquely downwards and backwards, and commonly called the origin of the muscle. This part is attached to the seven or eight lower ribs, and sometimes only to six, by an equal number of angular portions, of different length and breadth, separate from each other, and called digitations. The middle portions are broader and longer than the superior and inferior. We may distinguish in each an upper and lower edge and a point: indeed they exactly resemble the teeth of a saw on a large scale. The upper margin is fixed to the bony part of the rib, obliquely from above downwards, and from before backwards: and the fibres meet, in the four or five superior ones, with those of the lower margins of the serrated portions of the *ferratus magnus*: the lower margin is connected by cellular tissue to the upper edge of those serrated portions. The apex is generally elongated, and fixed to the under edge of the rib. The four or five superior digitations of the *obliquus externus* are received into the intervals of the origin of the *ferratus*. The three or four lower pieces are covered by the *latissimus dorsi*, and decussate with it. The first digitation is fixed near the cartilage of the rib; but the succeeding ones recede farther and farther from this point to the fifth; from which they again advance to the front of the ribs, so that the last arises from the cartilage as well as from the bone. It will follow from this description that the breadth of the *obliquus externus* is greatest at its middle, and that it becomes narrower from this part towards either the upper or lower edge.

The inferior margin is fixed, by fleshy and aponeurotic fibres, to the anterior third part of the outer edge of the crista ilii: from the spine of the bone it is extended, nearly in a straight line, over the broad concavity in the front of the *os innominatum*, to the pubes, to which it is attached, and it is connected between those two points to the *fascia lata* of the thigh.

The muscle is composed of fleshy fibres, and an aponeurosis; a line drawn perpendicularly from the chest to the anterior superior spine of the ilium would very nearly mark the distinction, all in front being aponeurotic, and all behind muscular. The latter fibres vary in length and direction; the upper ones are the shortest, and nearly horizontal, they grow longer to the middle, and pass from above forwards and downwards; the lower ones become again shorter, and their direction is nearly vertical. The two inferior digitations end in the crista ilii; but all the rest terminate in the aponeurosis.

The latter is broader below than above; it is thin, but strong, and made up chiefly of oblique fibres, following the same direction as those of the muscular part: some weaker fibres occasionally cross these. Irregular openings in it serve to transmit small nerves and blood-vessels. That part of the aponeurosis, which is stretched from the ilium to the pubes, is thicker and stronger than the rest, and is described, as if it were a distinct part, under the name of Fallopius's or Poupart's ligament, or the crural arch. By the attachment of the *fascia lata* it is firmly braced

braced down on the subjacent organs, and it is rendered a little convex towards the thigh. When the limb is extended and rolled outwards, the aponeurosis is drawn as much as possible downwards, and rendered tense; by bending and rotating the thigh inwards, it is relaxed. Through the space under the crural arch, the psoas magnus and iliacus internus, the anterior crural nerve, the femoral artery and vein, and the great absorbent trunks of the lower limb, pass. For a more particular account of the crural arch, see the article *HERNIA*, under the division *Crural hernia*: and for the attachment of the fascia lata to it, see *FASCIA*.

When the aponeurosis approaches the pubes, it separates into two portions, which constitute the pillars or columns of the abdominal ring. The upper or inner of these is fixed to the symphysis pubis, decussating with the corresponding one of the opposite side: the lower or outer (which is indeed the above-mentioned ligament of Poupart, or the crural arch) is attached to the spine and crista of the bone. The separation of these tendinous columns leaves a triangular space, called the abdominal ring, or ring of the external oblique muscle. The pubes constitutes the base of the triangle, the two pillars form its sides; and the apex is the part at which these separate from each other. It is not however pointed; since some transverse fibres, which connect the two columns together, round off this upper part of the opening. The abdominal ring is directed obliquely upwards and outwards; the upper part of it pointing towards the spine of the ilium: this part is often mentioned under the name of the external angle of the ring. The base of the triangle is situated downwards and inwards, with respect to the apex; and the two sides, of which one is external and the other internal, are continued from the apex obliquely downwards and inwards to the basis.

The spermatic chord and round ligament of the uterus, and the contents of inguinal hernia or bubonocoele, pass through this opening.

The *obliquus internus abdominis* (obliquus ascendens, petit oblique, ileo-abdominal) is smaller than the former, under which it is placed at the lateral and anterior part of the belly. It extends from above downwards from the lower edge of the chest to the upper margin of the pelvis; and from before backwards from the vertebral column to the linea alba. It is broad and thin, and much narrower behind than in front.

The external surface is covered behind by the latissimus dorsi, and in the rest of its extent by the obliquus externus. Its internal surface lies on the common mass of the sacro-lumbalis and longissimus dorsi, on the transversus, and the rectus.

The inferior edge of this muscle, or its origin, is fixed to the anterior three-fourths of the crista ilii, between the obliquus externus and the transversus, and to the outer half of the posterior surface of the crural arch, by fleshy fibres. From the latter it is extended, behind the ring of the obliquus externus to the pubes, to which it is attached. Between the latter bone and the crural arch the edge of the muscle is unattached; the spermatic chord passes under it, and receives a thin fasciculus of fibres from it, constituting the *cremaster* muscle, which see. In the female the round ligament of the uterus takes the same course.

The back edge is connected by an aponeurosis, common to it with the serratus posticus inferior and latissimus dorsi, to the spines of the lumbar vertebrae and sacrum. The upper margin is attached by fleshy fibres to the cartilages of the four lower false ribs, and is continuous, at the two last intercostal intervals, with the internal intercostal muscles. At

the edge of the rectus it becomes aponeurotic, and divides into two layers; an interior going in front of that muscle, and united to the aponeurosis of the obliquus externus; and a posterior passing behind it, fixed to the cartilage of the first false, and the last true rib, as high as the ensiform appendix, and confounded with the aponeurosis of the transversus. The front edge of the muscle is fixed to the whole length of the linea alba.

The obliquus internus is composed of a posterior and an anterior aponeurosis, and of muscular fibres between these. The former is attached to the back of the crista ilii, and to the spines of the sacrum and lumbar vertebrae. The muscular fibres arise from the posterior aponeurosis, from the crista ilii, and from the crural arch, and are, for the most part, directed obliquely upwards and forwards; the lower ones however approach to the horizontal direction, and the very lowest go a little downwards. They all end in front in a broad aponeurosis, which commences farther forward on the abdomen than that of the obliquus externus. This aponeurosis, at first simple, divides at the edge of the rectus into two layers, an anterior, which becomes inseparably connected to that of the obliquus externus; and a posterior, joined in the same way to the aponeurosis of the transversus. The rectus is interposed between these, both of which end at the linea alba. The lower fourth part of the aponeurosis goes entirely in front of the rectus; and its inferior end is fixed to the pubes.

Transversus abdominis, (transversalis, lombo-abdominal.) This, like the preceding, is a very broad and thin muscle, much broader before than behind, placed under the two obliqui, at the side and back of the abdomen, extending from the lower edge of the chest to the upper edge of the pelvis, and from the lumbar vertebrae to the linea alba. Externally it is covered, in nearly its whole extent, by the obliquus internus; the common mass of the sacro-lumbalis and longissimus dorsi, the serratus inferior posticus, and the latissimus dorsi, cover a small part of it behind. The internal surface is in contact with the peritoneum, with the fascia transversalis, and, for a small space, with the front of the rectus, and of the pyramidalis. The superior edge is fixed, by separate fleshy attachments, to the internal surface of the cartilages of the 6th and 7th true, and of all the false ribs; these meet, on the cartilages, with the origins of the diaphragm. It is continuous above with the triangularis sterni. The posterior edge is attached to the transverse and spinous processes of the four upper lumbar vertebrae. The lower margin is fixed to the inner edge of the crista ilii, and to the outer half of the crural arch. From the latter it is stretched, just behind the obliquus internus to the pubes; here indeed the two muscles are generally so closely connected, that they can hardly be separated without cutting through the fibres. The front edge terminates in the whole length of the linea alba. The transversus is composed of an anterior and posterior aponeurosis, and of muscular fibres between them.

The posterior aponeurosis consists of three portions; a middle, which is thickest, and fixed to the transverse processes of the lumbar vertebrae, behind the quadratus lumborum; an anterior, which is very thin, and goes in front of the quadratus to the same processes; and a posterior, which joins the common aponeurosis of the latissimus dorsi, serratus inferior, &c. The muscular fibres are all horizontal, and parallel, excepting the inferior, which descend a little; they pass from the cartilages of the ribs, from the posterior aponeurosis, from the crista ilii, and from the crural arch to the anterior aponeurosis. The middle ones are the longest, and the length diminishes from above downwards. The anterior aponeurosis commences by a semilunar edge, of which

the convexity is turned outwards; it proceeds, together with the posterior layer of the obliquus internus, behind the rectus to the linea alba; but it is split transversely at about the midway between the navel and pubes, and the lower part goes over the rectus to the linea alba: this is inserted below in the pubes.

Fascia transversalis.—Behind the crural arch, the inferior edge of the obliquus internus and transversus is placed, extending from the middle of that arch to the pubes, and covering behind a part of the ring of the external oblique. A thin fascia, called transversalis, is extended from the crural arch behind the transversus muscle, on the surface of which it is gradually lost. By this the ring of the external oblique is closed towards the abdomen; and, but for this there would be a direct opening into the belly behind that ring; it also shuts up the slit under the inferior edges of the muscles just mentioned. It consists of a thin and delicate expansion, yet has often a very distinct fibrous texture near the crural arch. If we trace it from this part upwards, we shall find it divided immediately into two portions, an internal and external, which have between them a considerable interval, just in the middle of the crural arch. The former of these is connected, by its inner edge, to the outer margin of the rectus abdominis, and to the inferior margin of the tendon of the obliquus internus and transversus; and both are gradually lost above between that muscle and the peritoneum. The posterior surface of this aponeurosis is lined by the peritoneum.

The division of the fascia transversalis into two portions would leave a wide opening above the crural arch; but the lower part of the obliquus internus and transversus shuts up this, except in a small part in the immediate neighbourhood of the arch. Through this aperture the spermatic vessels, and round ligament of the uterus, escape from the abdomen; they then go obliquely downwards and forwards, between the fascia and the aponeurosis of the external oblique, and finally emerge through the opening in the tendon of the external oblique.

If, under the term abdominal ring, we include the whole passage through the abdominal parietes, we must describe it as a canal, and not as a simple opening. The upper or inner aperture (formed by the fascia transversalis, and the lower border of the internal oblique and transversus muscles,) is rather nearer to the pubes than to the ilium; the lower or outer opening is the triangular aperture in the obliquus externus; and the canal itself extends obliquely between these points, being closed in front by the aponeurosis of the external oblique, and behind by the fascia transversalis.

The *rectus abdominis* (livero-pubien) is a long muscle, of a flattened figure, measuring about three fingers' breadths across, and extending along the front of the abdomen, from the chest to the pelvis. Its anterior surface is covered above by the aponeurosis of the obliquus externus, in the greatest part of its extent by the anterior layer of the obliquus internus, and below by the transversus and pyramidalis. The posterior surface covers the cartilages of the three last true ribs, a small part of those of the two first false ribs, the ensiform cartilage, the posterior layer of the internal oblique, the internal mammary and epigastric arteries, and, at the lower part, the peritoneum. Thus the rectus is inclosed in an aponeurotic sheath, in which we distinguish two layers. The anterior is formed in its upper three-fourths by the aponeurosis of the obliquus externus, with the anterior layer of that of the obliquus internus; and it is connected above with the pectoralis major. The inferior fourth part is formed by the aponeurosis of the obliquus externus, with the whole of that of the internus, and transversus. The posterior layer is composed of the posterior layer of the obliquus in-

ternus, and by the transversus. In the lower fourth part this layer is deficient, and the muscle rests on the peritoneum. The anterior layer is connected to the muscle by cellular tissue, except at its tendinous intersections; and the posterior by a loose cellular texture.

The superior extremity consists of three fleshy portions attached to the cartilages of the three last true ribs; it descends along the front of the abdomen, separated from the opposite muscle only by the linea alba. It preserves its original breadth through the upper three-fourths of its length, then is contracted by a sloping inwards of its outer edge, and terminates in a flattened tendon, inserted in the upper part of the pubes behind those of the three broad abdominal muscles.

The fleshy fibres of the rectus are interrupted on the front by transverse portions of tendon, extending from one side to the other, called tendinous enervations or intersections, and varying from three to five. One is opposite to the navel, one below, and two or three above; or that below the navel may be wanting. The latter of them extends only half way across. Their breadth varies, but does not exceed a quarter or half an inch; and their direction is zigzag. The front layer of the tendinous sheath adheres so closely to these intersections, that it cannot be separated without cutting them.

The *pyramidalis* (pubo-ombilic) is a small muscle of a triangular figure, placed at the lower and middle part of the abdomen, and extending from the pubes to the linea alba. Its basis is placed downwards, and attached by fleshy fibres to the upper and front part of the pubes, in front of the rectus. Its internal edge is parallel to the linea alba, to which it is attached in its upper third part, and is separated by that line from the opposite muscle. The outer margin is oblique from below upwards. Nearly the whole of the muscle is fleshy. The internal fibres are the shortest, and they gradually increase in length towards the outer edge. The aponeurosis of the obliqui and transversus cover it in front; and it covers behind the inferior extremity of the rectus.

The pyramidalis varies considerably in size; and sometimes is altogether deficient; sometimes it is found on one side only.

Motions produced by the abdominal Muscles.—These organs may be considered as protecting the abdominal viscera, and as the cause of various movements affecting the chest, abdomen, and pelvis.

The firmness of their resistance in front depends much on the broad aponeuroses which cover this part of the abdomen; when these are rendered tense by the action of the abdominal muscles, violent blows can be supported without injury; but an inconsiderable stroke will produce very serious effects when the parts are relaxed. Bichat regards the pyramidalis as a tensor of these aponeuroses. The thickness of the muscles at the sides, and the different course of their fibres, make them a very effectual protection for the viscera, and the muscles of the vertebral hollows are added behind.

If the pelvis and chest are fixed, the abdominal muscles contract the cavity of the belly, and press on the viscera: the transversus and internal oblique have the greatest effect in this way. The rectus and the external oblique cannot concur any further than when they represent straight lines from the chest to the pelvis. The enlargement and diminution of the abdomen go on almost entirely in front; the belly rises at that part in inspiration and sinks again in expiration. In this function all the abdominal viscera are constantly changing their position from the action of the diaphragm and abdominal muscles. See the description of the motions of the chest, in the article LUNGS.

The abdominal muscles concur further in expiration by drawing the ribs downwards; the transversus approximates them horizontally. In this case we suppose the vertebral column to be fixed; but if the latter be moveable, the chest will be bent forwards upon the pelvis. This flexion is direct if the right and left recti, pyramidales, and obliqui act together (the transversus have no concern in it); the trunk is bent laterally if the muscles of one side act separately. The obliquus externus, by drawing the ribs downwards and forwards, twists the trunk to the opposite side; the obliquus internus to its own side; the rectus and pyramidalis will also incline it to the same side. The sterno-cleido-mastoidei generally act with the recti to fix the sternum; and the recti act with them for the same purpose; thus, if a person lying down attempt to raise his head, and bend it forwards, the recti become quite tense.

The abdominal muscles will move the pelvis on the chest, if the latter part be fixed; and either directly, or obliquely, accordingly as those of both sides act together, or as they act separately on one side. This effect may be observed in climbing, tumbling, &c.

OBLIQUI Arytenoidei, a name given to some slender muscular fibres in the larynx. See **LARYNX**.

OBLIQUUS capitis inferior (grand oblique, atloido-axoidien). This muscle is placed at the upper and back part of the neck, between the spinous process of the second vertebra, and the transverse process of the first; it is elongated, and nearly round, larger in its middle than at the extremities. Arising at the side of the point of the spinous process of the vertebra dentata, below the rectus major, it goes obliquely outwards, forwards, and upwards, and is fixed to the posterior and inferior part of the transverse process of the atlas. Its two extremities are more or less tendinous; and the rest of the muscle is fleshy. Its anterior surface covers the second vertebra of the neck, and the vertebral artery; the muscle is covered behind by the complexus.

The obliquus inferior, by drawing the transverse process of the atlas to the spinous process of the second vertebra, rotates the atlas on the latter bone. In this motion the head is carried along with the atlas; and the face is turned towards the shoulder of that side, on which the muscle rests.

OBLIQUUS superior capitis (petit oblique, atloido-sous-mastoidien). This is a small flattened muscle, at the upper, back, and lateral part of the neck, extending from the transverse process of the atlas to the occiput. Its inferior extremity is fixed to the upper and back part of the apex of the transverse process of the atlas, in front of the preceding muscle, to which it is united. It passes upwards, backwards, and a little inwards, and is fixed to the outer part of the occiput. Its extremities are tendinous, and the middle is chiefly muscular. Its posterior surface is covered by the trachelo-mastoideus, splenius, and complexus; and its anterior surface covers the vertebral artery and the occiput. It extends the occiput on the atlas, and inclines it to one side.

OBLIQUUS oculi superior, } two muscles of the eye. See
OBLIQUUS oculi inferior, }
EYE.

OBLIZESZTI, in *Geography*, a town of Walachia; 40 miles E. of Bucharest.

OBLONG, in *Geometry*, a figure longer than it is broad. Thus a rectangular parallelogram, whose sides are unequal, is an oblong: so an ellipse is also an oblong.

OBNUNCIATION, **OBNUNCIATIO**, in *Roman Antiquity*. See **NUNCIATION**.

BOCZ, in *Geography*, a town of the duchy of Warsaw; 15 miles N.N.W. of Kalisch.

OBODOWKA, a town and fortress of Poland, in the palatinate of Braclaw; 28 miles S. of Braclaw.

OBOE, Ital. a performer on the *Hautbois*; which see. **OBOIAN**, in *Geography*, a town of Russia, in the government of Kirsck; N. lat. 51° 10'. E. long. 35° 54'.

OBOISTA, Ital. a performer on the hautbois.

OBOLEA, in *Botany*, was so called by Linnæus, from *obolus*, a small ancient coin; this name being therefore equivalent to *Moneywort*, and applied to the present plant, in allusion to the orbicular shape of the segments of its calyx. Siegesbeck had chosen the same appellation for a plant with rounded leaves, now become far more famous by another name, *Linnaea*.—Linn. Gen. 321. Schreb. 421. Willd. Sp. Pl. v. 3. 346. Mart. Mill. Dict. v. 3. Juss. 101. Lamarck Dict. v. 4. 509.—Class and order, *Didynamia Angiospermia*. Nat. Ord. *Personate*, Linn. *Pediculares*, Juss.

Gen. Ch. *Cal.* Perianth inferior, in two deep, large, rounded segments. *Cor.* of one petal; tube inflated, about the length of the calyx; limb in four deep, elliptic-oblong, rather unequal, entire, spreading segments, somewhat shorter than the tube. *Stam.* Filaments four, awl-shaped, inserted into the tube between the segments of the corolla, much shorter than the limb, the two nearest rather the longest; anthers small, roundish. *Pist.* Germen superior, ovate, compressed; style nearly cylindrical, the length of the stamens; stigma thickish, cloven, permanent. *Peric.* Capsule nearly ovate, compressed, somewhat tumid, of two valves opposite to the partition, and two cells? *Seeds* numerous, very minute.

Eff. Ch. Calyx in two deep rounded segments. Corolla four-cleft, nearly equal; tube inflated. Stamens between the segments of the limb. Capsule of two valves, with many seeds.

1. *O. virginica*. Linn. Sp. Pl. 881. (*O. virginiana*, radice fibrosa, summo caule foliis subrotundis; Pluk. Phyt. t. 209. f. 6. Moris. sect. 12. t. 16. f. 23.)—Native of Virginia and Pennsylvania. We received very perfect specimens from the Rev. Dr. Muhlenberg, which have enabled us to amend the generic character, except what regards the capsule being of one or two complete cells, a point we have not materials to determine. The plant appears to be very little known. Linnæus had no specimen; Michaux passed it over in silence; nor does Jussieu, or Lamarck, appear to have seen it, there being no figure of the genus in the "Illustrations" of the latter. Plukenet's representation, copied by Morison, is very good. The root consists of several thick fibres, and is probably annual and parasitical. Stem solitary, simple, three or four inches high, wavy, rather angular, smooth. Leaves none, except a few pair of opposite, small, rounded scales upon the stem. Cluster terminal, somewhat branched, dense. The large segments of the calyx, said to be purple beneath, give it a leafy aspect. The corolla much resembles that of an *Exacum*, in the dried state. Clayton describes it as of a pale red, and he says the plant flowers in April.

OBOLEA TERRÆ, in our *Ancient Law Books*, is a certain quantity of land, which some authors fix at half an acre; though others make it but half a perch.

According to Thomasius, the *obolus terræ* contains ten feet in length, and five in breadth.

OBOLEAH, in *Geography*, a town of Persia, in the province of Irak, on the Tigris. Although this town be not large, it is strong and well peopled, and its situation is peculiarly delightful; near Bassora.

OBOLEUS, in *Coinage*, an ancient silver money of Athens, the sixth part of a *drachm*; which see.

The word comes from the Greek, *οβολος*, of *οβολος*, *spit*, or *broach*, either because it bore such an impression, or because, according to Eustathius, it was in the form of it: but those now in the cabinets of the antiquaries are round.

They also struck silver pieces of one, two, three, four, and five oboli, of half, and of one-fourth of an obolus. (See DRACHM.) In Greece, they had also brads and copper oboli. The brads obolus, which was at first equal in size to the Roman sestertius, or large brads, lessens by degrees to about the size of a silver drachma. One of the latter occurs in Gessner, Pl. xlviii. N^o 19, in which is a coin of Nyssa, with an ear of wheat on one side, ΝΙΣΣΑΙΩΝ; reverse, a youth on the prow of a ship, holding a coin in his hand, and οβολος. Although the era of the above coins cannot be precisely ascertained, the period of declension in size must have been from Augustus down to Gallienus: and we may safely suppose that the copper obolus, at first above the size of large brads, was used in Greece about the time of her first subjection to Rome: accordingly Vitruvius, who lived in the time of Augustus, speaks of copper oboli, lib. iii. c. 1. When the lepta ceased, the chalci came in their room, with the dichalcus, and hemiobolion of brads. See CHALCHOS.

OBOLUS was also used, among our *Ancestors*, for half a noble or florin; where the noble was esteemed as the penny, and its quarter part a farthing.

In effect, in the old histories and accounts of coins, we are to understand by the word denarius, the whole coin, be it angel, rial, &c.; by the obolus, its half; and by quadrans, its fourth part.

OBOLUS, in *Medicine*, is used for a weight of ten grains, or half a scruple.

Du Cange says, the obolus weighs three carats, or four grains of wheat; others divide it into six areolæ, and the areola into seven minutes; others into three filiquæ, each filiqua into four grains, and each grain into a lentil and a half.

Among the Sicilians obolus also denoted a weight of a pound.

OBONA, in *Geography*, a town of Spain, in Asturia; 24 miles W. of Oviedo.

OBORKOW, a town of Poland, in the palatinate of Belcz; 12 miles N.N.W. of Belcz.

OBORNIKI, a town of the duchy of Warsaw; 20 miles from Posen.

OBORNOI, a cape on the coast of Russia, in the government of Archangel, in the Frozen sea; 200 miles S.E. of Kola. N. lat. 67° 50'. E. long. 50° 34'.

OBOVATUM FOLIUM, in *Botany*. See LEAF.

OBOXINTA, in *Geography*, a town of Japan, in the island of Niphon; 22 miles S. of Meaco.

OBRA, a town of the duchy of Warsaw; 26 miles S. of Posen.

OBRANG, in *Botany*, the name given by the people of Guinea to a very singular and remarkable plant, the virtues of which they greatly praise. They boil it in water, and use the decoction by way of fomentation, to take down swellings of the testicles. Its leaves have some faint resemblance to those of our liquorice, whence Petiver has called it *glycyrrhizæ folio singulari frutex Guineensis spinis gemellis*.

OBRAWA, or BOBROWA, in *Geography*, a town of Moravia, in the circle of Brunn; 26 miles N.W. of Brunn.

OBRECHT, ULRIC, in *Biography*, a learned philologist and civilian, was born in 1647 at Straßburg, where his grandfather had been professor of the law. His taste for literature and general knowledge was displayed at a very

early period, and at the age of nineteen he printed a commentary upon the "Somnium Scipionis," and "A Dissertation upon the Principles of Wisdom." He afterwards published "Animadversiones in Dissertationes de Ratione Status in Imperio," which was an answer to a celebrated work of that time, against the claims of the house of Austria. He was made professor of law at Straßburg, and by his industry, and economy of time, he found means to compose various works besides fulfilling the duties attached to his office. One of these was a "Prodromus Rerum Alsaticarum," being a sketch of a great work which he meditated upon the province of Alsacia. After the capture of Straßburg by Lewis XIV., Obrecht, who had hitherto been a Lutheran, became a Catholic, and went to Paris in 1684, where he abjured Lutheranism before Bossuet, who complimented him with the title of an "Epitome of all the Sciences." On his return he was appointed by the king to preside in the senate of Straßburg. After this he was sent by his majesty to Frankfort as his commissioner for supporting the rights of the princeps-electoral Palatine to the inheritance of her ancestors, and he wrote an elaborate work, entitled "Excerpta Historica de Natura Successionis in Monarchia Hispaniæ," for the purpose of proving the hereditary title of Philip V. to the crown of Spain. He died in the year 1705, in the 58th year of his age. Moreri.

OBRECHT. See HOBRECHT.

OBRECKHEIM, in *Geography*, a town of Germany, in the palatinate of the Rhine; 19 miles E. of Heidelberg.

OBREPTITIOUS, OBREPTITIUS, a quality of letters patent, or any other instrument which confers a favour, title, or concession; denoting it obtained of a superior by surprise, or by concealing from him the truth, which was necessary to have been expressed, in order to render it valid.

In which sense the word stands opposed to *surreptitious*, where some falsehood has been expressed, in order to procure it the more easily. Obreption annuls the grant, wherever found.

By the canon law, a person demanding a benefice, without expressing those he is already possessed of, forfeits, &c. by obreption.

OBRIEN'S BRIDGE, in *Geography*, a small town of the county of Clare, Ireland, where there is a bridge over the river Shannon. Near it is Montpellier, where there is an excellent sulphurous spring. This place is eight miles N.E. of Limerick.

OBRIEN, *Knights of Obrine*, a military order instituted in the 13th century by Conrade, duke of Mazovia and Cujavia, whom some authors call also duke of Poland.

He first gave them the name of *Knights of Jesus Christ*. Their first grand-master was Bruno. Their chief end was to defend the country from the Prussians, who were yet idolaters, and committed great cruelties.

Duke Conrade putting them in possession of fort Obrine, they hence took a new name; and it was agreed between them, that whatever lands they conquered from the Prussians, should be equally divided with him.

But the Prussians blocking up the fort, so that none of the knights could get out, the order became useless, and was soon suppressed. Upon this, Conrade called in the Teutonic knights.

OBRITZ, in *Geography*, a town of Austria, on the Taya; 6 miles W. of Sonneberg.

OBRIZUM, in *Antiquity*, a kind of gold. Pliny says, that they call the gold that has been several times purified in the fire, *obrizum*. "Auri experimento ignis est ut simili colore rubeat quo ignis; atque ipsum *obrizum* vocant."

Abriz in Arabic, or Persian, signifies fine gold without mixture, which the Greeks and Latins call *obrizum*.

OBSANG, in *Geography*, a town of Germany, in the principality of Culmbach; 9 miles N.W. of Bayreuth.

OBSCURA, *CAMERA*. See *CAMERA Obscura*.

OBSCURA Clara. See *CLAIR-OBSCURE*.

OBSCURE, something that is dark, or that only receives and returns a little light.

OBSCURE is also used, in a figurative sense, for a thing that is not clear, express, and intelligible; that one does not fully apprehend; or that may be construed into divers senses.

OBSCURE Notion, or *Idea*. See *NOTION*, or *IDEA*.

OBSCURE, Clair. See *CLAIR-OBSCURE*.

OBSCURITY, that which denominates a thing obscure.

Obscurity is a fault that may either be in the perception, or the diction.

Obscurity in the perception arises chiefly hence, that we do not conceive things as they are, or as we find them; but as we judge them to be before we know them: so that our judgment precedes our knowledge, and is made the rule, or standard of our conceptions. Whereas nature and reason direct, that things should be judged of according as they are known; and that they are to be known, not as they are in themselves, but only in such manner as God was pleased to have them known.

Obscurity in the diction may arise, first, from the ambiguity of the sense of words; secondly, from the figures or ornaments of rhetoric; thirdly, from the novelty or obsolescence of the words.

OBSECRATION, **OBSECRATIO**, in *Rhetoric*, a figure by which the orator implores the assistance of God, or man. This figure Cicero makes admirable use of, for K. Deiotarus, to Cæsar. "Per dexteram te istam oro, quam regi Deiotaro hospes hospiti porrexisti: istam, inquam, dexteram non tam bellis & in præliis, quam in promissis & fide firmiorrem." Thus Virgil:

"Quod te per cœli jucundum lumen, & auras,
Per genitorem oro, per spem surgentis Iuli,
Eripe me his, invicte, malis"——

OBSEQUENS, **JULIUS**, in *Biography*, a Latin writer, who is supposed to have flourished in the reign of Honorius, and wrote a book entitled "De Prodigis;" from the subject of which he is conjectured to have been a heathen. It contains an account of the prodigies occurring in the Roman history, such as those narrated by Livy, whose very words he frequently borrows. Notwithstanding its trifling and delusive subject it has been frequently reprinted. The earlier part of the work is lost, which was supplied, in a supplement, by Conrad Lycosthenes, a corrector of the press at Basil. The supplementary articles were distinguished by different characters in the edition of Scheffer, 1679; the subsequent editions are those of Hearne, 1703; Oudendorp, 1720; and of Kappius and Erhard in 1772.

OBSEQUIES, funeral solemnities, or ceremonies performed at the burials of eminent personages.

The word is derived from the Latin *obsequium*, *obedience*; these obsequies being the last devoirs we can render to the deceased. See *BURIAL* and *FUNERAL*.

OBSERVANCE literally denotes the act of observing, or complying with, a rule, law, or ceremony.

Hence observance is sometimes also used for a rule, statute, or ordinance to be observed.

OBSERVANCE, *Observantia*, is particularly understood, in a monastic sense, of a community of religious, who are

bound to the perpetual observation of the same rule. In which sense the word coincides with *congregation* or *order*.

The Cordeliers denominated themselves, *Religious of the Observance*; the *great*, and the *lesser observance*. See *CORDELIERS*.

Those Franciscans are called *Brethren of the Observance*, who religiously observe the primitive laws and institution of their founder, in opposition to *Conventuals*; which see. See also *FRIARS Observant*.

Among the Bernardines, there are monks of the *strict observance*, who eat nothing but fish.

OBSERVANTINES, religious Cordeliers of the observance. In Spain there are barefooted Observantines.

OBSERVATION, in the *Sea Language*, the taking of the sun's, or any star's, meridian altitude, in order thereby to find the latitude.

For the method of making an observation, see *LATITUDE* and *LONGITUDE*.

The finding of a latitude from the meridian altitude observed, they call *working an observation*.

OBSERVATIONS, in *Astronomy*. See *CHRONOMETER*, *CIRCLE*, *CELESTIAL Observations*, *LUNAR Observations*, &c.

OBSERVATORY, a building furnished with instruments for observing the heavenly bodies. It is generally defined, "a building in the form of a tower, erected on an eminence, and covered with a terrace, for making astronomical observations." But this description, though it may apply to ancient observatories, does not agree with modern practice, where firmness of foundation, and a convenient disposition of instruments, are considered of more importance than any particular form of structure, or eminence of situation.

Fixed observatories are those where instruments are fixed in the meridian, by which, with the aid of astronomical clocks, the right ascensions and declinations of the heavenly bodies are determined, and motion, time, and space made to measure each other. Such buildings and apparatus only are called *regular* observatories, although very useful operations are sometimes performed, and important discoveries made, where there are no instruments fixed in the meridian.

As navigation essentially depends on the determinations made in observatories, such establishments have been considered of great national importance, especially in maritime states; and hence they have been liberally endowed by different governments. Even private observatories have been, in many places, erected at a considerable expence, and their number has been greatly increased of late years; a circumstance which, while it marks the progress of science, does honour to the age in which we live.

Besides the important advantages of improving nautical astronomy, observatories are, in themselves, objects of the highest interest to every scientific and liberal mind. Here the inventions and discoveries of the greatest men in all ages are united, and applied to the most grand and useful purposes. Here theory is reduced to practice, and science illustrated by art; or, in the words of the poet, (applied to an observatory,)

"Here truths sublime and sacred science charm,
Creative arts new faculties supply,
Mechanic powers give more than giant's arm,
And piercing optics more than eagle's eye:
Eyes that explore creation's wondrous laws,
And teach us to adore the great designing Cause."

In short, an observatory may be considered as affording the most sublime display of the works of God and man.

Impressed with the importance of this subject, we shall here endeavour to give a more full account of observatories than has been hitherto attempted in works of this kind.

History of Observatories.—All nations where astronomy has been studied or improved, boast of having had observatories at an early period, although ancient history affords but little information on the subject. It was not, indeed, until considerable progress had been made both in astronomy and the mechanical arts, that any attempts succeeded either in constructing instruments, or erecting edifices for astronomical purposes.

“The first observatories of man,” says the eloquent Bailly, “were the fields, and his eyes his instruments,” and his progress with these aids alone was astonishing.” From the same interesting writer, as well as from other good authorities, we learn that the instruments of ancient astronomers were very large and of rude construction, mostly of wood, and some of stone. They consisted chiefly of gnomons, dials, and astrolabes; and long tubes were used in the way of telescopes. Deep wells were also sunk in dry places, from the bottom of which the stars might be seen in the day-time. Most buildings for astronomical observations were of great altitude, and were chiefly erected in very high situations.

In Chaldæa, a country celebrated in the early annals of astronomy, the lofty temple of Belus was used as an observatory; and in Egypt, the famous tomb of Ofymandias was applied to the same purpose. This building is said to have contained a golden circle for celestial observations, which was 365 cubits in circumference, and one cubit in thickness. Little credit, however, can be given to such extravagant descriptions.

The pyramids of Egypt are, by some writers, supposed to have been originally observatories, and in support of this opinion it is argued, that they were built to face the four cardinal points. But this practice was very general in ancient times, even in the construction of dwelling-houses, which were mostly made to front the east: and our Christian churches also have been generally built with a similar attention to the points of the compass. The great height of the pyramids was, however, favourable for making celestial observations, particularly for the purpose of astrology, which was a leading study in those times, and which chiefly required an accurate view of the rising and setting of stars. It is, however, certain, that practical astronomy was much improved in Egypt, particularly in the famous school of Alexandria, where an observatory was built 300 years before the Christian era, and continued for more than five centuries under a succession of celebrated names, among which may be mentioned Aristellus, Hipparchus, Ptolemy, &c.

The Gentoo nations appear to have made a very early progress both in the theory and practice of astronomy. These people have traditions and vestiges of ancient observatories, upon which ingenious disquisitions may be found in Bailly's “*Histoire de l'Astronomie Indienne*,” and in the “*Asiatic Researches*,” by sir William Jones, Messrs. Hunter, Bentley, Colebrooke, and others. We shall, however, no longer dwell upon conjectures concerning antiquity, but shall give an account of observatories of more modern date in India; from the structure and apparatus of which, an idea may be formed of their antecedent establishments of the kind, as they differ, in almost every particular, from European observatories.

These Hindu institutions, five in number, were constructed nearly at the same period, about 200 years ago. They were built by order of the emperor Mahommed Shah, with

a view to reform the calendar by means of astronomical observations; and he chose for his principal astronomer Jeyfing, or Jayasinha, the rajah of Ambhere. These observatories were built at Delhi, Benares, Matra, Oujein, and Suvai Jeypoor, and all under the direction of Jeyfing. The observatory at Benares has been minutely described by sir Robert Barker in the *Philosophical Transactions* for 1777, in which he has given several plates both of the buildings and instruments: and as all the other observatories were built and furnished nearly on the same plan, his description may be deemed here sufficient for the whole, and we therefore make the longer extract from it.

Benares Observatory.—“We entered this building,” says sir Robert Barker, “and went up a stair-case to the top of a part of it, near the river Ganges, that led to a large terrace, where, to my surprise and satisfaction, I saw a number of instruments yet remaining, in the best preservation, stupendously large, immoveable from the spot, and built of stone, some of them being upwards of 20 feet in height; and though they are said to have been erected 200 years before, the graduations and divisions on the several arcs appeared as well cut, and as accurately divided, as if they had been the performance of a modern artist. The execution in the construction of these instruments exhibited a mathematical exactness in the fixing, bearing, and fitting of the several parts, in the necessary and sufficient supports to the very large stones that compose them, and in joining and fastening them into each other by means of lead and iron cramps.

“The situation of the two large quadrants whose radius is nine feet two inches, by being at right angles with a gnomon at 25 degrees elevation, are thrown into such an oblique situation, as to render them the most difficult, not only to construct of such a magnitude, but to secure in the position for so long a period, and affords a striking instance of the ability of the architect in their construction; for, by the shadow of the gnomon thrown on the quadrants, they do not appear to have altered in the least from their original position; and so true is the line of the gnomon, that, by applying the eye to a small iron ring of an inch diameter at one end, the sight is carried through three others of the same dimension to the extremity at the other end, distant 38 feet 8 inches, without obstruction, such is the firmness and art with which this instrument has been executed. This performance is the more extraordinary when compared with the works of the artificers of Hindoostan at this day, who are not under the immediate direction of an European mechanic; but arts appear to have declined equally with science in the east.

“Lieut. Col. Arch. Campbell, at that time chief engineer in the East India company's service at Bengal, a gentleman whose abilities do honour to his profession, made a perspective drawing of the whole apparatus that could be brought within his eye at one view; but I lament he could not represent some very large quadrants, whose radii were about twenty feet, being on the side whence he took his drawing. Their description however is, that they are exact quarters of circles of different radii, the largest of which I judged to be twenty feet, constructed very exactly on the sides of stone walls built perpendicular, and situated, I suppose, in the meridian of the place: a brass pin is fixed at the centre or angle of the quadrant, from which the Bramin informed me they stretched a wire to the circumference when an observation was to be made; from which it occurred to me the observer must have moved his eye up or down the circumference, by means of a ladder or some such contrivance, to raise and lower himself, till he had discovered the altitude

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of any of the heavenly bodies in their passage over the meridian, so expressed on the arcs of these quadrants: these arcs were very exactly divided into nine large sections; each of these again into ten, making ninety lesser divisions or degrees; and those also into twenty, expressing three minutes each, of about $\frac{2}{3}$ ths of an inch asunder; so that it is probable, they had some method of dividing even these into more minute divisions, at the time of observation.

"My time would only permit me to take down the particular dimensions of the most capital instrument, or the greater equinoctial sun-dial, which appears to be an instrument to express solar time by the shadow of a gnomon on two quadrants, one situated to the east, and the other to the west of it; and indeed the chief part of their instruments at this place appear to be constructed for the same purpose, except the quadrants, and a brass instrument described hereafter. There is another instrument for the purpose of determining the exact hour of the day by the shadow of a gnomon, which stands perpendicular to, and in the centre of a flat circular stone, supported in an oblique situation by means of four upright stones and a cross piece; so that the shadow of the gnomon, which is a perpendicular iron rod, is thrown on the divisions of the circle described on the face of the flat circular stone. There is also a brass circle, about two feet diameter, moving vertically on two pivots between two stone pillars, having an index or hand turning round horizontally on the centre of this circle. This instrument appears to be made for taking the angle of a star at setting or rising, or for taking the azimuth or amplitude of the sun at rising or setting.

"The use of another instrument I was at a loss to guess. It consists of two circular walls; the outer of which is about forty feet in diameter, and eight feet high; the wall within about half that height, and appears intended for a place to stand in to observe the divisions on the upper circle of the outer wall, rather than for any other purpose; and yet both circles are divided into 360 degrees, each degree being subdivided into 20 small divisions, the same as the quadrants. There is a door-way to pass into the inner circle, and a pillar in the centre of the same height with the lower circle, having a hole in it, being the centre of both circles, and seems to be a socket for an iron rod to be placed perpendicularly in it. The divisions on these, as well as all the other instruments, will bear a nice examination with a pair of compasses. There is also a smaller equinoctial sundial, constructed on the same principle as the large one.

"This observatory at Benares is said to have been built by the order of the emperor Ackbar; for as this wise prince endeavoured to improve the arts, so he wished also to recover the sciences of Hindoostan, and, therefore, directed that three such places should be erected; one at Delhi, another at Agra, and the third at Benares. Some doubts have arisen with regard to the certainty of the ancient Bramins having a knowledge in astronomy, and whether the Persians might not have introduced it into Hindoostan when conquered by that people: but these doubts, I think, must vanish, when we know that the present Bramins pronounce, from the records and tables which have been handed to them by their forefathers, the approach of the eclipses of the sun and moon, and regularly as they advance give timely information to the emperor and the princes in whose dominions they resided." *Philosophical Transactions*, vol. lxvii. p. 598, or *Abridgment*, vol. xiv. p. 214.

The foregoing account of the Benares observatory has been further illustrated by William Hunter, esq. in a very elaborate article in the *Asiatic Researches*, vol. v. p. 177. in which he gives a full and particular description of the

other four Hindu observatories, and refers occasionally to Sir Robert Barker's description and plates.

Mr. Hunter's article begins with an account of the origin of those observatories, and he gives a transcript of Jeyfing's preface to his astronomical computations in the original language, with a literal translation. This preface contains an account of the astronomer's labours and plans, and also of his conference with the emperor on the subject of building the observatories. As the paper is extremely interesting and curious, and also connected with our subject, we shall extract a few passages from it.

"Let us," says Jeyfing, "devote ourselves to the altar of the king of kings; hallowed be his name in the book of the register, of whose power the lofty orbs of heaven are only a few leaves; the stars, and that heavenly courser the sun, a small piece of money in the treasury of the empire of the most high."

"But since (Jeyfing) the well-wisher of the works of creation, and the admiring spectator of the theatre of infinite wisdom and providence, from the first dawning of reason in his mind, and during its progress towards maturity, was entirely devoted to the study of mathematical science, and the bent of his mind was constantly directed to the solution of its most difficult problems; by the aid of the supreme artificer he obtained a thorough knowledge of its principles and rules."

* * * * *

"Seeing that very important affairs, both regarding religion and the administration of empire, depend upon these; and that in the time of the rising and setting of the planets, and the seasons of eclipses of the sun and moon, many considerable disagreements of a similar nature were found; he (Jeyfing) represented it to his majesty of dignity and power, the sun of the firmament of felicity and dominion, the splendour of the forehead of imperial magnificence, the unrivalled pearl of the sea of sovereignty, the incomparably brightest star of the heaven of empire; whose standard is the sun; whose retinue the moon; whose lance is Mars, and his pen like Mercury, with attendants like Venus; whose threshold is the sky; whose signet is Jupiter; whose sentinel Saturn; the emperor descended from a long race of kings; an Alexander in dignity; the shadow of God; the victorious king, Mahommed Shah, may he ever be triumphant in battle."

"His majesty was pleased to reply, 'Since you, who are learned in the mysteries of science, have a perfect knowledge of this matter; having assembled the astronomers and geometricians of the faith of Islam and the Bramins and Pandits, and the astronomers of Europe, and having prepared all the apparatus of an observatory, do you so labour for the ascertaining of the point in question, that the disagreement between the calculated times of those phenomena, and the times in which they are observed to happen, may be rectified.'

* * * * *

"Although this was a mighty task, which, during a long period of time, none of the powerful rajahs had prosecuted; nor, among the tribes of Islam, since the time of the martyr prince, whose sins are forgiven, Mirza Uluga Beg to the present, which comprehends a period of more than 300 years, had any one of the kings, possessed of power and dignity, turned his attention to this object; yet, to accomplish the exalted command which he had received, he (Jeyfing) bound the girdle of resolution about the loins of his soul, and constructed here (at Delhi) several of the instruments

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struments of an observatory, such as had been formerly erected at Samarcand, agreeably to the Muffulman books.

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"Thus an accurate method of constructing an observatory was established; and the difference which had existed between the computed and observed places of the fixed stars and planets, by means of observing their mean motions and aberrations with such instruments, was removed. And in order to confirm the truth of these observations, he constructed instruments of the same kind in Suvai Jeypour, and Matra, and Benares, and Onjein. When he compared these observatories, after allowing for the difference of longitude between the places where they stood, the observations and calculations agreed. Hence he determined to erect similar observatories in other large cities, that so every person who is devoted to these studies, whenever he wishes to ascertain the place of a star, or the relative situation of one star to another, might by these instruments observe the phenomena."

From the foregoing extract of the Asiatic Researches it appears, that although sir Robert Barker's description of Benares observatory is allowed to be very correct, yet he was not well informed as to the situation or number of the other observatories, or the names of their founders.

At PEKIN, in China, there was an imperial observatory built in the thirteenth century, on the city walls; and in 1669, father Verbiest, a missionary Jesuit, having been made president of the tribunal of mathematics there, and chief observer, obtained permission from the emperor Cam-hi to furnish it with new instruments, a catalogue of which may be seen in Duhalde's Description of China.

Other observatories were built in China subsequently by the French missionaries, and by the Portuguese Jesuits, who distinguished themselves very much by their improvements in astronomy, notwithstanding the duties of a very different nature in which they were employed, and to which they are supposed likewise to have paid due attention. The instruments of the Pekin observatory are described as exceedingly large, but the divisions less accurate, and the contrivance in some respects less commodious than the instruments made at that period in Europe. The chief were, a sextant eight feet radius, a quadrant six feet radius, an azimuthal horizon, also a celestial globe, an armillary zodiacal sphere, each six Paris feet diameter, (the French toise which equals 6 feet $4\frac{1}{2}$ inches nearly English measure).

It is said that Copernicus, in 1540, was the first European who set an instrument in the meridian, but it is stated by Weidler, Bailly, and Costard, that the first regular observatory in Europe was erected at Cassel in 1561, by William I., landgrave of Hesse, who furnished it with the best instruments the age could afford. He is said to have made very accurate observations in concert with his friend and correspondent, Tycho Brahe, who was at the above period rising into great fame, and the high expectations formed of him were fully answered.

The next observatory in Europe that deserves particular notice, was that of Tycho Brahe himself, which owed its origin, according to Bailly, to a very extraordinary cause. This was the appearance of a new star of the first magnitude, in the constellation of Cassiopeia. It was seen by different astronomers about the 10th of November, 1572, and as some of them had been before in the habit of observing that constellation, the appearance was supposed to be instantaneous, which added to the unusual astonishment and consternation that universally prevailed on the occasion. It was brighter than Jupiter or Venus when nearest to the earth, and was visible to the naked eye at noon day. After a short time it gradually declined,

and in sixteen months totally disappeared. Many curious and alarming predictions were the consequence, and Tycho Brahe, who observed it from the beginning, was so impressed with the phenomenon, that he formed a resolution of making a new and accurate catalogue of all the stars, as there had been nothing of the kind regularly performed since the days of Hipparchus, who, it is remarkable, had been stimulated to the undertaking by a similar cause, that is, by the sudden appearance and disappearance of a new star. Tycho Brahe communicated his design to several eminent men, who encouraged the plan. He first proposed to settle at Basse, which afforded at once a pure atmosphere, and a ready communication with the learned men of Germany, Italy, and France; but the landgrave of Hesse wrote to Frederic II., king of Denmark, intreating him to encourage the astronomer to remain in his own country. The king, fully sensible of the loss with which he was threatened, offered him the small but fertile island called Huen, or Hwen, in the Sound, as a desirable situation for an observatory. His majesty conferred on him also other princely grants and immunities, which were accepted. He besides undertook to defray the expence of building and furnishing the observatory there, without any limitation of expence, a munificence which has immortalized his name. The first stone of the observatory was laid the 8th of August, 1576, and the place was called Uranibourg, or the Heavenly city. It was a building of 60 feet square, and 70 feet high, with four towers, all contrived for astronomical purposes. It was furnished with a noble collection of instruments, many of which had been invented and brought to perfection by the astronomer himself. He had numerous assistants, whom he supported and instructed. (For his astronomical observations there, see the life of BRAHE, TYCHO.) Among his instruments was a celestial globe, of six feet diameter, which is said to have cost above 1000*l*. It was after his death carried to Prague, next to Neis, and lastly to Copenhagen, where it was burnt in the great conflagration which happened there in 1728. Many of the instruments of this great astronomer were long preserved, but have been gradually lost, and his favourite city Uranibourg, which, in his time, was visited by kings and princes, who paid him the highest honours, has been long a heap of ruins, but is still visited by the learned, and regarded with pious veneration. It should have been mentioned that his celebrated sextant has been consecrated in the heavens as a constellation, under the breast of the lion. On large globes and atlases it is marked *Sextans Uranie*, but on common ones only *Sextans*.

We shall now proceed to give some description of observatories of a more modern date, beginning with those of France.

French Observatories.—The Imperial observatory (formerly called the "Royal Observatory," and during the time of the republic the "Observatory") was built in 1667, and is stated by La Lande to be "the most splendid monument ever dedicated to astronomy." It is 160 English feet in front, and 120 in breadth, and 90 feet high. Its vaults are 90 feet deep, so that it is 180 feet from top to bottom. For a particular description of the architecture, see Blondel; and for the arrangement and disposition of the instruments, see Bernouilli's *Lettres Astronomiques*, also La Lande's *Astronomie*, and Monnier's *Histoire Celeste*.

Besides the above building, new rooms have been constructed, close by the side of the observatory, where a large transit instrument and circle, by Ramsden, have been set up. In 1788 new vaults were made, and also a small observatory erected at the top of the building, which commands an extensive view of the horizon, and the king (Louis XVI.) established

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established three observers here, that the course of observations might as little as possible be interrupted.

The following account of other observatories at Paris, given by La Lande in 1792, is worthy of being inserted here, as interesting in the history of practical astronomy.

"The astronomers of the academy had besides several private observatories erected in different parts of Paris, as the royal observatory was not sufficient for all. That of M. le Monnier has been, from the year 1742, in the garden of the Capuchins. That of the Marquis, which Joseph de l'Isle used in 1748 at the Hotel de Clugny, where I laboured during two years, is at present occupied by M. Messier. That of La Caille still exists in the Mazarin college. I, as well as M. d'Agelet, have made several observations there since his death. That of the palace of Luxembourg is above the Port Royal. Joseph de Lisle observed there, and I likewise occupied it for some time. That of M. Pingré at the abbey of St. Génévieve was built in 1756. There is one of M. Cagnoli's, rue de Richlieu, which this able astronomer built at his own expence in 1785, when he still resided at Paris.

"The observatory of the military school, built for M. Jaurat in 1768, was occupied afterwards by M. d'Agelet. The late M. Bergeret, receiver-general of finances, constructed in 1774, at my request, a large mural quadrant of eight English feet radius, the last and the best instrument made by the celebrated Bird, the loss of whose talents we still regret. This instrument was obtained by the military academy, as well as an excellent transit instrument, and a parallactic telescope. M. d'Agelet made a great number of observations there from 1778 to 1785, when he left it to make a voyage round the world with La Perouse. In 1788, the changes made in the military school occasioned the demolition of this observatory; but it has been rebuilt, by my desire and care, a little more to the west, with all necessary attention and expence, so that it is the most complete observatory we have at Paris. Having received the direction of it, I began, in 1789, to make the following observations. M. le François La Lande, my relation and pupil, who is a very good astronomer, has also made a prodigious number of observations, and we observed, in 1791, more than ten thousand northern stars, with excellent instruments. This work was very much wanted, and I consider it as one of the most important and difficult things that could be undertaken for astronomy.

"An observatory was built in 1775, at the Royal College, for the use of the professor of astronomy of this celebrated school. M. Geoffroy d'Asly built, in 1788, an observatory at his house, rue de Paradis, and it will become one of the most useful by the zeal and intelligence of M. de Lambre, who uses it."

Such was the state of observatories at Paris in 1792. At present (1813), De Lambre is the chief of the imperial university. Messier and Biot succeeded him at the Royal College, now the College de France. Burckhardt is astronomer at the military school; Lefrançois la Lande resides at the Place de Cambray; and Bouvard superintends the imperial observatory, assisted by Arago.

It is worthy of notice here, that the famous mural quadrant, with which La Lande and his relation determined the position of a great number of stars, as above-mentioned, has been consecrated in the heavens as a constellation, and is placed between Hercules, the Serpent, and Bootes. It is marked *Quadrans muralis*, and contains forty stars.

The following were the other observatories established in different parts of France, as stated by La Lande.

The MARSEILLES observatory, which has been rendered famous by the observations of M. de Sylvabelle.

At TOULOUSE, the observatory of M. Darquier has been made sacred by the zeal and abilities of this learned man. Observatories have also been built in the same city by M. Garipuy and M. Bonnepos. Here astronomy has been more successfully cultivated than in any other provincial city in France. The principal observatory is at present (1813) under the superintendence of M. Vidal.

At LYONS, the College observatory, which was built by father St. Bonnet, is a very fine edifice, on an elevated situation.

At DIJON, M. Necker, about the year 1780, converted the tower of the king's lodge to an observatory, and the abbé Bertrand has made very accurate observations here.

At MONTPELLIER there has long been an observatory erected on one of the towers of the city. M. Ratte and M. Poitevin have distinguished themselves here as able astronomers.

At BEZIERS, the Bishop's tower was converted to an observatory, where some interesting observations have been made by M. Bouillet, particularly on Saturn's ring.

At AVIGNON, an observatory was built by father Bonfati so early as 1683, and it has been since occupied by a succession of learned ecclesiastics, who have distinguished themselves in practical astronomy.

At STRASBURG, Brackenboffer, professor of mathematics, had an observatory over the gates of the city, and he has been succeeded by Herzenfschneider in 1790.

At BOURDEAUX is an observatory 75 feet high, and 20 feet square. It is situated in the finest part of Tournay, in latitude 45° , which is the middle of the temperate zone that we inhabit. Here M. Turgot procured a complete set of observations to be made on the length of a pendulum vibrating seconds; upon which father Bosovich has made an interesting memoir.

At BREST a small observatory was built for the naval academy, and plans have been set on foot for erecting a more considerable edifice.

At ROUEN there is an observatory belonging to M. Bouin, in which he has made many good observations.

At MONTAUBAN the duc de la Chappelle founded an observatory, where he himself has made many accurate and interesting observations, particularly of the transit of Venus over the sun in 1769.

German Observatories.—In Germany a great number of observatories have been established, and that country has produced also several very able astronomers.

At BERLIN, Frederic I., king of Prussia, founded an observatory in 1711, under the direction of Leibnitz, who was president of the Academy of Sciences there. It is a large square tower, very steady. Here Grischow and Kies made various observations: and La Lande also observed here about the year 1752, where, he says, he raised enormous pillars, to which he attached the mural quadrants, north and south. (*Memoires de l'Academie*, 1751 and 1752.) King Frederic II. added a very fine building to it, where the Academy of Sciences of Prussia has held its assemblies. M. Bode has been many years the astronomer royal here, and has distinguished himself both as an accurate observer, and as the publisher of the most complete celestial atlas extant, entitled "*Uranographia*," which is accompanied with a well arranged catalogue of the stars, and an interesting history of the constellations.

At VIENNA, the empress Maria Theresa built an observatory in the year 1755 for the university, and furnished it with many superb instruments. There is also one belonging to the academical college, which was built and endowed by the Jesuits in 1735, and it is likewise furnished with very fine instruments, chiefly made by English artists,

tists, and a succession of very learned men have observed there. The reputation of the university observatory was maintained for many years by the abbé Maximilian Hell, who conducted the Vienna Ephemeris, and this work is now continued by M. Treifneckir, his successor.

At GOTTINGEN there is an observatory memorable by the labours of Tobias Mayer, and by those more recently of Harding, who discovered the planet Juno in 1804.

At NUREMBERG an observatory was built so early as the year 1678, and another in 1692. M. Zimmert and M. Wuzzelbau have distinguished themselves here both as able authors and accurate observers.

At CASSEL an observatory was built, in 1714, by Charles I., landgrave of Hesse, heir to the territories and taste of the celebrated William, the early friend and fellow labourer of Tycho Brahe.

In 1740 an observatory was built at Griessen; and in 1768 at Oúrtfouurg, in Franconia. In 1788 there was one built at Leipzig, on an old tower of great firmness. Observatories have been likewise erected and supported with great credit at Manheim, Cremsmünster, Lambach, Polling, Prague, and Gratz.

At BREMEN there is an observatory belonging to Dr. Olbers, an eminent physician, who has rendered his name immortal by the discovery of the two new planets, Pallas and Vesta. See PLANET.

At LILIENTHAL, near Bremen, M. Schroeter, governor of the district, erected an observatory about the year 1786, and furnished it with excellent instruments. He is highly celebrated as an accurate and interesting observer, particularly of the surfaces and rotations of the planets and the moon. He approaches nearer than any other astronomer to Dr. Herschel in telescopic discoveries.

At SEEBERG, near Gotha, a considerable observatory was built, in the year 1788, by the duke of Saxe Gotha, and he appointed M. Zach, now baron Zach, the superintendent, who has highly distinguished himself as a profound and accurate astronomer. In 1798 he was visited by La Lande, when, according to Voiron, (*Histoire de l'Astronomie*, p. 369.) all the great astronomers of Germany met at Gotha to see the patriarch of astronomy, and to pay him their homage. This observatory is reckoned one of the most beautiful and complete in Europe; it is situated on a fine elevation, about a league from the town. There is here a large transit, with two murals of eight feet radius, and a circle of eight feet diameter, all by Ramsden and his successor Berge.

At BRUNSWICK there is an observatory belonging to Dr. Gauss, well known by his determinations of the orbits of the new planets, and other important labours.

In HUNGARY there are observatories at Buda, Tyrnau, and Erlau. Similar establishments are also at Greiffswalde in Pomerania, and at Mittau in Courland.

In POLAND there is an observatory at Cracow, and another at Wilna: the latter was built and richly endowed by the countess Puzynina, a lady of fine genius as well as liberality. It was finished in 1753, and the instruments with which it is furnished were of great variety and value. In 1765 the king of Poland, by letters patent, gave it the title of Royal observatory, and appointed the learned jesuit Poczobut astronomer royal, who, in 1788, added another observatory, which he furnished with new instruments, chiefly made by Ramsden.

In SWEDEN observatories have been built at Stockholm and Upsal; that at Stockholm was founded in 1746, by the Academy of Sciences. In 1753, Wargentin was appointed astronomer to it, and in 1783 he was succeeded by Nicander. This observatory is situated on a hill north of the town, and contains a good collection of instruments, all made by English artists.

The observatory at Upsal was built and endowed in 1739 by the king of Sweden: it was first superintended by the celebrated Celsius, who has been followed by a succession of able astronomers, particularly Hooker and Wargentin. The latter is well known as the author of the tables of Jupiter's satellites.

At DANTZIC there was an old observatory, celebrated as having been used by Hevelius, who has given a full description of it in his work, entitled "*Machina Cœlestis*." A new observatory was also built in that city in the year 1778, and is at present superintended by Dr. Wolff.

At COPENHAGEN the famous astronomical tower was finished in 1656. It was built by king Christian IV. at the recommendation of Longomontanus, and has been for many years under the management of Mr. Bugge, who is celebrated as a very able astronomer. In his collection of observatories, he states that the kings of Denmark had established observatories in Norway, Iceland, and Greenland.

In HOLLAND attention was paid to practical astronomy while it was a maritime state, but the science has of late been much neglected. In 1690 an observatory was erected upon the college of the university, and at Utrecht an ancient tower was, in 1726, converted into an observatory. Here the celebrated Van Musschenbroek observed for many years with great accuracy, and he was succeeded by M. Hennert.

In SPAIN observatories have been built at Cadiz, Madrid, Seville, and Carthage. The observations made at Cadiz (at the Marine academy) by Miguel and Varilla, have been published in two volumes, which also contain a catalogue of the instruments of the observatory, chiefly constructed by French artists; and hence the observatories of Spain differ very little from those of France. Of late years, however, English instruments have been introduced there.

At LISBON, in 1728, king John V. had an observatory erected at his palace, which was well furnished, and accurate observations have been made there by the Jesuits, who also erected an observatory at their own college of St. Anthony, where father Carbon, in 1726, made good observations on the satellites of Jupiter. See *Phil. Trans.* vol. xxxv. p. 408.

In 1787, a Royal observatory was constructed at the Chateau de St. George, in Lisbon, which was superintended by M. Custodio Gomez. There is also one at COIMBRA, which contains a fine equatorial by Troughton.

At PETERSBURG an observatory was built, in 1725, by the czar Peter, who shewed great zeal for science in general, and particularly for astronomy. When he was in England, some years before that period, he visited the Royal Observatory at Greenwich, where he examined both the building and the instruments with very great attention. The observatory which he afterwards built is one of the most magnificent in Europe. It is 130 feet high, with three stories, all fit for astronomical purposes. M. de l'Isle has made, according to La Lande, a great number of excellent observations here, which are preserved in manuscript in the Marine depot.

At Moscow an observatory was built a few years ago, and furnished with some excellent English instruments, chiefly by Cary; but it is probable that they have been destroyed in the late conflagration of that city.

In ITALY, practical astronomy has been cultivated with much assiduity and success during the last century, chiefly by ecclesiastics, and particularly by the Jesuits.

At ROME, cardinal Zelada constructed, at his own expense, on the southern part of the Roman college, a very fine observatory, with the large sector of father Boscovich, and other instruments by Ramsden and Dollond; the abbé Calandrelli observed here with great attention and accuracy

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for many years. Other buildings of a similar description have been erected in different parts of Rome.

At BOLOGNA a magnificent observatory was built in 1714, in the palace of the Institute, by the munificence of the celebrated count Marfigli; and pope Benedict XIV. gave afterwards a large sum of money towards the purchase of instruments. Here a succession of able astronomers have observed, among whom may be mentioned Manfredi, Zanotti, Canterzani, &c.

At PISA the observatory is in the form of a tower. It was built in 1730, at the expence of the university, and supplied with superb apparatus made by Sisson, Short, Graham, &c. Perelli observed here for many years, and had for a successor M. Slope, who published an excellent collection of observations in 1789.

At MILAN there is an observatory, which is reckoned one of the most useful in Italy. It was built in 1765, at the cost of the college of the Jesuits, chiefly through the zeal of father Pallavicini, and under the direction of father Boscovich, who also contributed liberally to the expence. The instruments have been made with great care by the principal French and English artists. Among the observers may be also mentioned Reggio, Oriani, and Cefaris.

At FLORENCE, father Ximenes erected an observatory at the college of Jesuits, which contains a quadrant by Tofcanelli, larger than any other known, with which he made observations to prove the secular diminution of the obliquity of the ecliptic. At his death he bequeathed the whole to the college. In 1772 the grand duke Leopold built an observatory, which M. Fontana superintended, and in 1786 several fine instruments by Ramsden were added to it.

At TURIN father Beccaria erected a small observatory; but in 1790 a large one was built at a very considerable expence, by the king of Sardinia, at the Royal College of Nobles, and the direction of it given to the abbé Caluso.

At VENICE an observatory was constructed by father Panigai, and a small one near the town by M. Miotti. One was also built at PARMA by father Belgrado, and another at BRESCIA by father Cavalli.

At VERONA, Cagnoli, eminent both as a mathematician and astronomer, erected an observatory at his own expence in 1787, and placed in it the best instruments, with which he has made very accurate and important observations, particularly on the precession of the equinoxes, and on the places of 473 northern stars, and 28 southern, of which he has made a catalogue. In these determinations he has been perhaps more attentive than any other astronomer to the minute changes of refraction, and to the aberration of light.

At PADUA there is an observatory, which, in 1778, was furnished with instruments chiefly made by Ramsden. It has been many years under the direction of M. Toaldo, who has published several useful works, especially a treatise on Meteorology, which gained him the prize at the academy of Montpellier.

The observatory at Padua was originally the tower of the cruel tyrant Egellin, in the 13th century; in the dungeons of which he confined such prisoners of war as fell into his hands during the civil commotions of that period. In 1769 it was converted into an observatory, and this happy change gave rise to the following distich of father Boscovich; who united the rare talents of poet and mathematician.

“ Quæ quondam infernas turris ducebat ad umbras,
Nunc Venetum auspiciis pandit ad astra viam.”

which may be thus translated:

“ This tow'r, which led to Pluto's realms below,
To heaven's bright regions now the way doth shew.”

In some of the islands of the Mediterranean observatories

have also been established. We shall, however, notice only those of MALTA and SICILY.

In 1783, the grand master Emmanuel de Rohan, an amateur and enlightened protector of science, invited to Malta chevalier d'Angos, a skilful astronomer, who converted a tower of the palace into an observatory, which was furnished with the finest instruments that could be procured. In a few years he made a great number of valuable observations, which he intended to publish, but in March 1789, the observatory having caught fire, the instruments were broken, and the papers burnt, a serious loss to astronomy, particularly as this was the most southern observatory of Europe, in latitude 36°.

At PALERMO an observatory has been constructed in the palace of the viceroy, under the direction of father Piazzzi, who went to Paris in 1787 to study astronomy, and who afterwards visited England, in order to consult the principal artists on the construction of instruments. In 1789 he returned to Palermo, and added to the apparatus a fine transit instrument, and a complete circle, made by Ramsden. His first labours were directed to the formation of a correct catalogue of stars, and, as a foundation, he chose Wollaston's catalogue, and particularly, as his chief points of reference, Dr. Maskelyne's 36 stars. The positions of some of the larger stars he verified by nearly a hundred observations, and in the prosecution of this task, in 1801, he discovered a new planet, which he named Ceres, in honour of Sicily, as that island was, on account of its fertility, anciently consecrated to the goddess Ceres. This discovery was the more important, as it excited the curiosity and research of other astronomers, by which three more planets have been since discovered.

English Observatories.—The *Greenwich observatory*, or the Royal Observatory of England, was built and endowed by king Charles II., who, to use the words of Bailly, “well knew how essential astronomy was to a maritime and commercial people like the English, who aspired to the empire of the seas.” This building was erected on the site of the ancient moated tower of duke Humphrey, uncle to Henry VI., and the first stone of it was laid Aug. 10, 1675, by Mr. Flamsteed, who had been appointed astronomer royal. It is situated on the highest eminence of Greenwich park, about 160 feet above low water mark. The soil here is particularly favourable for such an institution, being of a flinty gravel, through which the rain soon passes, and thus the atmosphere is generally dry, which contributes to the preservation of the instruments, as well as to the uniformity of refraction.

This establishment comprehends two principal buildings, one of which is the observatory, and the other the dwelling-house of the astronomer royal. The observatory is an oblong edifice, running east and west, and containing four rooms, or apartments on the ground-floor. The first, or most easterly room, has been lately erected for the reception and sitting up of a very fine transit circle, by Troughton, and a clock of great value by Hardy.

The next apartment is the transit room. It has a double sloping roof, with sliding shutters, which are opened both north and south, with great ease, by pulleys. The transit instrument, which is eight feet long, and the axis three feet, is suspended on two stone pillars. This instrument is famous as having been used by Halley, Bradley, and Maskelyne. It was originally made by Bird, and has been successively improved by Dollond and Troughton. The astronomical or transit clock, which is attached to a stone pillar, was made by Graham, and has been rendered very accurate by Earnshaw.

The third apartment is the assistant observer's library and place for calculation; and the western apartment of the building is the quadrant room. Here is erected a stone

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stone pier, running north and south, to which are attached two mural quadrants, each of eight feet radius. That on the eastern face, which observes the southern meridian, was made by Bird, and the other, which observes the northern, by Graham. Suspended to the western wall is the famous zenith sector, with which Bradley made the observations at Kew and Wanstead, that led to the discoveries of the aberration of light, and the nutation of the earth's axis.

South of the quadrant room is a small wooden building for making occasional observations in any direction, where only the use of a telescope, and an accurate knowledge of the time, are required. It is furnished with sliding shutters on the roof and sides, to view any point of the hemisphere, from the prime vertical down to the southern horizon. It contains some excellent telescopes, particularly a forty-inch achromatic, with a triple object-glass, and a five-foot achromatic, both by Dollond; with a six-foot reflector, by Dr. Herschel.

To the north of the observatory and east of the house are two small buildings, covered with hemispherical sliding domes, in each of which is an equatorial sector, by Sisson, and a clock, by Arnold. These are chiefly used for observing comets.

With respect to the dwelling-house, the lower apartments are occupied by the astronomer royal, and over them is a large octagonal room, which contains a great variety of astronomical instruments, with a library, consisting chiefly of scientific and scarce works. On the top of the house is an excellent camera obscura, which could not be better placed for the exhibition of interesting objects.

It is not unworthy of notice, that early in Flamsteed's time there was a well sunk in the south-east corner of what is now the garden, behind the observatory, for the purpose of seeing the stars in the day-time, and observing the earth's annual parallax. It was a hundred feet deep, with stone stairs down to the bottom: but it has been long arched over, as the improvements in the telescope have rendered it unnecessary for astronomical purposes.

The observations made at the Royal Observatory are universally allowed to possess an unrivalled degree of accuracy. M. Delambre, in a paper composed by him, on the life and labours of Dr. Maskelyne, and read before the National Institute, Jan. 4, 1813, makes the following remark. "He (Dr. Maskelyne) has given a catalogue of stars, not numerous, but so accurate, as to have served, almost solely for the last 30 years, as the foundation of all astronomical researches. In short, it may be said of the four volumes of Observations which he has published, that if, by a great revolution, the sciences should be lost, and that this collection only were saved, there would be found in it sufficient materials to construct almost an entire edifice of modern astronomy; which cannot be said of any other collection."

For similar attestations made by foreign astronomers of the utility and importance, as well as superior accuracy, of the Greenwich observations, see our life of Dr. Maskelyne.

The following are the names of the astronomers who have officiated here in succession, with the times of their services respectively: Flamsteed, 43 years; Halley, 23 years; Bradley, 20 years; Bliss, 2 years; and Maskelyne, 46 years. (For a particular account of their labours, see their lives, as well as the various astronomical articles of this work.) Dr. Maskelyne has been succeeded by John Pond, esq. F. R. S. who was appointed astronomer royal in February 1812.

In giving a description of the Royal observatory, it may be deemed an omission not to notice the peculiar beauty of the situation. The building itself is no way

remarkable, but it commands one of the finest prospects, perhaps, in the world, both for richness and variety; and the interest of the view which it commands of public prosperity is greatly enhanced by considering that it is chiefly the result of nautical science; and that those numberless vessels which cover the Thames with the wealth of nations, and which traverse the remotest seas, owe their science and their safety, in a great measure, to the Greenwich observatory.

Dr. Herschel's Observatory at Slough, near Windsor, though not a fixed one, will ever claim a distinguished place in the history of astronomical institutions. It differs from all other observatories in plan and apparatus; and it exceeds all others in the number of its discoveries. For this important establishment the world is indebted to the munificence of his present majesty, George III., who has liberally patronized Dr. Herschel, and who on other occasions has shewn himself a zealous and enlightened promoter of astronomy.

In describing this observatory, it should be premised, that Dr. Herschel's labours derive a peculiar character and interest from the circumstance, that his discoveries are the result of his own inventions. For to his profound knowledge of astronomy he unites that of optics, both in theory and practice, by which he has been enabled to cast and polish mirrors for reflecting telescopes, greatly superior to any others, not only in magnifying power, but in collecting, or, as it were, preserving light, by which vision is wonderfully extended, and which he very expressively denominates "the power of penetrating into space." The telescopes, which are all made under his direction, are of various sizes, from two feet in length up to forty feet, and the apparatus and machinery with which they are mounted are also of his invention, and exhibit a very ingenious display of mechanism.

As his larger telescopes could not be conveniently managed within the cover of a building, they are mounted in the open air, where they stand pointing to the heavens in different directions, and make a most magnificent and impressive appearance. Thus they are placed in what has been called the primitive observatory of man, "*non sub tecto sed sub cælo in puro dio.*"

His largest telescope, which La Lande says he viewed with astonishment, is 40 feet long and 5 in diameter. It contains a mirror of about a ton weight; and this great instrument, with nearly an additional ton of cases, &c. is managed by a very slight force. It is placed on a large circular frame, which turns on rollers, and the top is suspended by ropes from very lofty ladder-work. Thus, by a system of wheels, pinions, racks, and pulleys, the motions, both horizontal and vertical, are given, and hence any celestial object is readily found and commodiously viewed. It was finished in 1787, and on the first trial a new satellite of Saturn was discovered by it, and a second soon after.

For a particular description of Dr. Herschel's telescopes, with their respective magnifying and space-penetrating powers, see our article TELESCOPE; and for his various discoveries, see ASTRONOMY, DOUBLE STARS, GALAXY, MOON, NEBULÆ, PLANET, SATELLITE, STAR, and SUN. It should be further stated here, that a very full and accurate account of his inventions and discoveries, as well as a particular description of his telescopes and their apparatus, (with plates,) will be found in the Philosophical Transactions, to which he has been a most important contributor, having supplied that work with nearly 70 elaborate and ingenious communications.

We cannot conclude this sketch without noticing two of his telescopes, of smaller size, which are famous in the annals of discovery. The first is a two-feet Newtonian reflector, with which his sister Miss Carolina Herschel, whose astronomical attainments do great honour to her

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sex, discovered six comets; and the other is his seven-foot reflector, by which he discovered the Georgian planet at Bath, in 1781.

This telescope has, in consequence of the discovery, been made a constellation in the heavens with the universal approbation of astronomers. It is placed between Gemini, the Lynx, and Auriga, and contains 81 stars. In Bode's atlas it is engraved with its apparatus, and marked "Telescopium Herschellii."

This effectual mode of conferring immortality has been happily noticed by a scientific nobleman, the earl of Rosse, who lately paid a visit to Dr. Herschel, and on seeing the doctor's name thus written among the stars, applied the following lines from Prior, and immediately added the concluding couplet, which is well worthy of being preserved.

" Thus the distinguished part of men,
With compass, pencil, sword, or pen,
Should in life's visit write their name
In characters that may proclaim
That they with ardour strove to raise
At once their own and country's praise."
But Herschel's fame shall higher rise,
His name is written in the skies.

Dr. Herschel, though in his 75th year, is still an active and indefatigable observer. He was born at Hanover, Nov. 15, 1738, a period which will be ever memorable in the history of astronomy.

The King's private Observatory in Richmond gardens is extremely beautiful in structure and apparatus, as well as in situation. It was built, in 1768, by order of his present majesty George III., who, it is said, made several observations here, particularly of the transit of Venus in 1769. It contains a fine transit instrument, a zenith sector, and a mural arc, with several good telescopes, especially a ten-foot reflector of Dr. Herschel's. Here is a superb equatorial on the top of the building, which is covered with a moveable roof. There are also two fine orreries, with an excellent collection of philosophical instruments, and some cases of minerals and other natural curiosities. It was built under the direction of Dr. Demainbray, and has been, for some years, in the care of Mr. Rigaud.

Oxford Observatory is a most magnificent structure, and the instruments perfectly correspond with the building. It was begun in 1772, from very ample funds bequeathed by Dr. Radcliffe, and the land on which it stands was the gift of the duke of Marlborough. The transit instrument, which is ten feet long, shews very small stars in the day-time. It is said to have cost 150 guineas, the zenith sector 200 guineas, and the two mural quadrants 600 guineas. There are also very excellent telescopes and clocks here, the former by Dr. Herschel and Dollond, and the latter by Shelton. It was built under the direction of Dr. Hornsby, professor of astronomy in the university, who observed here for many years, and he has been succeeded by Dr. Robertson, the present professor of astronomy.

The observations are all registered, and consist chiefly of the right ascensions and zenith distances of the sun, moon, planets, and fixed stars. In Dr. Hornsby's time, the registry was sometimes broken from ill health; for he had no assistant observer: but one has been of late added to the establishment, so that the observations will not, in future, be liable to the like interruptions.

At CAMBRIDGE there have been small observatories at Christchurch, Trinity, St. John's, &c. and a plan is said to be now on foot for erecting one upon a great scale, and worthy the scientific fame of that learned university.

Portsmouth Observatory.—At the Royal Marine academy, Portsmouth, there is an observatory under the direction of Mr. Professor Inman, which is of peculiar utility, both in teaching the pupils practical astronomy, and in finding the rate of time-keepers for seamen. It was built and many years ably managed by the late master, Mr. Bailey, who had been previously assistant astronomer at the Royal Observatory, and likewise with Capt. Cook in his latter voyages.

At *Christ's Hospital*, Mr. Wales (who had also served under Dr. Maskelyne and Capt. Cook) erected a small observatory at his own expense, when he became master of the royal mathematical school there; and lately the governors, at the recommendation of Mr. Evans, the present master, have ordered that the observatory shall be repaired, and furnished with new instruments.

The Royal Society have at Somerset House a small observatory, which is generally superintended by the secretary for the time being.

At *Highbury House* an observatory was built in the year 1787, by Alexander Aubert, esq., which for perfection of plan and splendour of apparatus perhaps has never been equalled by any private individual. This gentleman, whose scientific and liberal pursuits deserve honourable mention, died in the year 1806, and his grand collection of instruments was disposed of by auction, and of course dispersed. Similar notice may be taken of other observatories contemporary with that of Highbury, particularly those of count Bruhl at Harefield, sir George Shuckburgh, at Shuckburgh, and William Larkins, esq. at Blackheath, all of which were on a great scale, and have been discontinued after the demise of the owners. Thus in private observatories, though the astronomers may bequeath their apparatus to their heirs, they cannot transfer either their taste or their science. It is only in public establishments that permanence can be expected.

Among the private observatories of the present day, the following alphabetical list may be also mentioned.

Blackheath	-	Stephen Groombridge, esq.
Blenheim	-	Duke of Marlborough.
Cambridge	-	Rev. Mr. Catton.
Chislehurst	-	Rev. Francis Wollaston.
Derby	-	William Strutt, esq.
East Sheen	-	Rev. William Pearson.
Finbury Square	-	Dr. Kelly.
Godwood	-	The duke of Richmond
Gosport	-	Dr. William Burney.
Hackney Wick	-	Colonel Beaufoy.
Hayes	-	William Walker, esq.
Highbury Terrace	-	Capt. Huddart.
Hoddesdon	-	William Hodgson, esq.
Islington	-	Gavin Lowe, esq.
Paragon, Southwark	-	James Strode Butt, esq.
Park-lane	-	Sir Harry Englefield, bart.
Rose Hill, Sussex	-	John Fuller, esq.
Sherburn	-	Earl of Macclesfield.
St. Ibbes, Hitchen	-	Mr. Professor Lax.
Woolwich	-	Rev. Lewis Evans.

Scotch Observatories.—In the different universities of Scotland professorships of astronomy have been established, but it has been here, as in most other universities, the theory of the science has been more attended to than the practice. At Edinburgh and Aberdeen there have been, however, observatories; and at Glasgow there is also a small one belonging to the college, but of late a magnificent one has been erected by a society of gentlemen, which is likely, when finished, to be very useful as well as honourable to that commercial city.

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Irish Observatories.—In Ireland two observatories have been established on a great scale, the one at Dublin, and the other at Armagh.

The observatory belonging to Trinity college, Dublin, commonly called the Dublin observatory, was begun in the year 1783. It was founded by Dr. Francis Andrews, provost of that college, who bequeathed a large income for this purpose, which was to commence upon a particular contingency happening in his family. When this event had taken place, the college, with their wonted zeal for the promotion of science, determined not to lose time by waiting for the accumulation; but advanced from their own funds a sum considerably exceeding the amount of the original bequest.

They chose for their professor of astronomy and observer the Rev. Dr. Usher, a man of extensive learning and indefatigable research, who was directed to proceed to England, to order from Mr. Ramsden the best instruments he could make, without any limitation of expense, and it may be here noticed, that the peculiar anxiety of this eminent artist to execute the order in the greatest perfection, caused a considerable delay.

The apparatus first ordered were, a transit instrument of six feet focal length with a four feet axis, bearing four inches and a quarter aperture, with three different magnifying powers up to 600. An entire circle of ten feet diameter on a horizontal axis for measuring meridian altitudes. An equatorial instrument, with circles of five feet in diameter: and an achromatic telescope, mounted on a polar axis, and carried by an heliostatic movement. Clocks were also ordered from Mr. Arnold, without any limitation of price.

The situation chosen for the observatory is on elevated ground, about four English miles N.W. of Dublin. The foundation is a solid rock of limestone, of several miles extent; and the soil is very favourable, being a calcareous substance called limestone gravel, which is remarkable for absorbing the rain, and thus contributing to a dry atmosphere.

The plan of the building unites at once both elegance and convenience: it fronts the east, and the lower range of windows and doors are twenty-three in number. In the centre there is a magnificent dome of three stories high, with a moveable roof for the equatorial instrument, which is placed upon a pillar of sixteen feet square, of the most substantial masonry, and surrounded by a circular wall of a foot distance, that supports the moveable dome, and also the floors, which in no part touch the pillar: thus, no motion of the floor or wall can be communicated to the instrument. The aperture for observation in the dome is two feet and a half wide. For the manner by which the movement of the dome is effected; see our article *Rotatory Roof*.

On each side of the centre building, and joined to it, are two handsome edifices, of two stories high, for the residence of the professor, and to each is attached a wing of one story only, but terminated with domes of two stories. These domes are intended for occasional observations, such as of eclipses, occultations, and comets. The wings, however, are not yet completely finished.

But the most important erection belonging to this establishment is behind the main building, and at right angles to it, in order to obtain an uninterrupted view both north and south. This is the meridian or transit room, which contains both the transit instrument and the circle. It is thirty-seven feet long, twenty-three broad, and twenty-one high. Fine pillars of Portland stone are erected for both instruments on the most firm basis, and the floor is so framed as to let all the pillars rise totally detached from it: and such was Dr. Usher's attention to extreme accuracy, that he first ascertained the pillars to be perfectly homogeneous, lest any variety in their substance might ad-

mit of a difference in their expansion or contraction by heat, cold, or other changes of atmosphere. The clocks are attached to pillars of the greatest steadiness also: they were made by Arnold, who exerted his best skill, and are finished in a masterly manner: the pallets are of ruby; and all the last holes of the movement jewelled; the suspension springs are of gold, with Arnold's own five barred pendulum, and cheeks capable of experimental adjustment, so as to make all vibrations isochronal, whatever may be the excursion of the pendulum.

Such are the plans and apparatus of this splendid establishment. And we may now for a moment be permitted to turn our attention to the beauties of nature, which are strikingly exhibited in the surrounding scenery; and which cannot be better described than in the words of Dr. Usher himself, in the Transactions of the Royal Irish Academy, vol. i. p. 13.

"Around the dome is a platform commanding one of the most extensive and varied prospects that can be imagined. On the south of the observatory there is a view of the grounds of lord Beftive, with a gentle declivity to the river, and from thence a varied picture of the rich scenery of the woods of the Phoenix park, terminated in the back ground by the majestic grandeur of the Wicklow mountains. To the south-east we have the city of Dublin, distant four miles, the semicircular bay, with the shipping and the great south wall extending five miles into the sea, and terminated by the light-house; the ridge of rocky hills, called the Three Brothers, forming the head of Dalkey, and bearing Malpas's obelisk on the highest point. Nearly in this direction, in particular states of the atmosphere, the Welsh mountains are distinctly visible. On the east and north-east of Clontarf and its environs are the Hill of Howth, Ireland's Eye, and Lambay. From thence to the north-west the prospect is so uncommonly level and extensive as to gratify the astronomer much more than the painter; but even this variety is not without its beauty. To the south-west we have the picturesque ruins at Castlenock, and to the west the extended and rich view of Kildare, in which Mr. Conolly's obelisk forms a grand and central object."

Dr. Usher did not, however, long enjoy the beauties of this scenery, nor the pleasures of astronomy. He died in 1790, before the instruments had been all supplied. He was succeeded by the Rev. Dr. Brinkley, who had distinguished himself at Cambridge by profound analytical investigations, and who has since greatly enriched the Transactions of the Royal Irish Academy by mathematical and astronomical communications. His labours in practical astronomy, however, have been greatly impeded by the doubts and indecision of Mr. Ramsden, particularly in the construction of the ten-foot circle, upon which very delicate and important operations depended. After making some progress in this instrument, he rejected it, and began another of nine feet diameter, which he proceeded in so far as actually to divide it, and this he rejected also, and fixed upon one of eight feet, which was left unfinished at his death. After some years labour, his successor, Mr. Berge, finished the circle in a most accurate manner; and hence it was not placed in the observatory until July 1808, a delay which must have greatly circumscribed the utility of the institution. Ramsden's indecision is supposed to have arisen from an opinion which he latterly formed, that very large instruments are most liable to get out of adjustment.

From this new circle in the hands of Dr. Brinkley, important results are expected, particularly on parallax, aberration of light, and refraction. He has been for some time engaged in a series of observations with a view to explain the cause of variations that he has found in the zenith distances of certain stars at different times, which do not seem explicable

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explicable by any cause at present generally allowed. He has found a difference between the zenith distances of α Lyra, when in opposition and conjunction, which may be explained by a parallax of about two seconds. Such a parallax is, however, doubted; but it is by astronomers who have not had perhaps the accurate means, which he possesses, of referring their observations to the zenith. The new transit circle just erected at Greenwich possesses this advantage, and great hopes may therefore be formed from the concurrent operations of those two instruments.

Armagh Observatory.—At Armagh, the metropolitan city of Ireland, and anciently the seat of a large university, there has been an observatory erected and endowed in 1793, by the most reverend Richard lord Rokeby, primate of all Ireland, who distinguished himself upon various other occasions by very liberal grants for the diffusion of science and literature. Besides founding a collegiate school, and public library, he bequeathed a large sum towards an object which he had always much at heart, the re-establishment of a university in this city, and it is said that he thought this plan would be greatly promoted by previously erecting an observatory and museum here, which his lordship accomplished at the expense of about 15,000*l*.

The observatory is erected on the summit of a gently rising hill, about 90 feet above the general level of the town, and surrounded by several undulating hills all nearly of the same altitude. This building is founded on a base of limestone, and all the walls are of large hewn stone, and of the most firm and substantial workmanship. The tower, which joins the dwelling house, contains a very fine equatorial by Troughton, fixed upon a large pillar, which is raised so high that the instrument in the dome can overlook all the buildings. To the east of the house is a range of buildings for the transit room, and other astronomical purposes. The principal instruments, besides the equatorial and transit, are a ten-feet sextant by Troughton; a ten-feet reflecting telescope by Dr. Herschel; a five-feet triple object-glass achromatic telescope by Dollond; and also a fine night glass upon an equatorial stand. The clocks are by Earnshaw of London, and Crosthwaite of Dublin.

In this establishment a liberal income is allowed to the principal astronomer, and a good salary to his assistant. It has been superintended from the beginning by the Rev. James Archibald Hamilton, D. D. dean of the cathedral church of St. Coleman, Cloyne, who has contributed several learned papers to the Transactions of the Royal Irish Academy, chiefly on astronomical subjects. His observations, particularly on the fixed stars, are considered very accurate, and some of his declinations have been transcribed into the Philosophical Transactions of the Royal Society of London in 1806.

The registered observations here are those made with the transit instrument and equatorial; and also an account of the temperature and weight of the atmosphere. Of these, a series of about eighteen years is preserved. The right ascensions of the sun and moon, compared with the fixed stars, are regular and unbroken; but their north polar distances have not been so constantly taken, as they are only observed by the principal astronomer, whose pastoral duties must occasionally interfere with his astronomical labours.

It may be finally noticed, that there are belonging to this establishment about 20 acres of plantation and pleasure grounds, which are open for the recreation and health of the inhabitants of the city. Thus the views of the benevolent founder extended to various kinds of good. He spent a long life in acts of public and private beneficence, and his last work was the observatory, which he began in his 84th year; and which he just lived to see finished.

General Directions for Building and Furnishing Observatories.

—The descriptions of the principal observatories in the foregoing columns have been the more minute, as such may be supposed to convey more instruction than general directions; we shall, however, insert here a few additional hints, which may likewise be found useful.

In building an observatory, attention should be paid to situation, soil, and foundation, as well as to structure; and in furnishing one, regard must be had both to the proper choice, and convenient disposition of instruments.

The *situation* should be sufficiently elevated to command a view of the horizon, especially to the north and south; but very high places are not eligible, as they mostly attract clouds, and are in other respects too much exposed to the severities of weather.

In choosing a situation, it will be requisite to make preparation for a meridian mark, and for this purpose it would be convenient if the observatory could be placed in the meridian line of some building, or other permanent object, upon which the mark may be made, and this is done as soon as the transit instrument is set correctly in the meridian, by which it may be afterwards regulated. (See *TRANSIT Instrument*.) If two meridian marks can be set up, one north, and the other south, it will be desirable, and they should not be less than 500 yards distant from the observatory: the farther the better, provided they are visible. The observer should have free access to them, as it may be necessary sometimes to illuminate them by night. These marks ought to be nearly on the same level, and not subject to be obscured by gross exhalations, as such are supposed to create horizontal refractions, and to make the marks appear out of the meridian.

The *soil* should be naturally dry, which is generally the case when it is of a gravelly or stony kind; but clay soils that do not soon absorb the rain cause exhalations and damps, which not only injure the instruments, and obscure the atmosphere, but greatly increase the irregularities of refraction.

The *foundation* should be of the most solid kind, and therefore a rock of some extent, or a hard gravel, should be chosen, and where such cannot be had, all adventitious firmness should be obtained either by constructing deep arches, or by piles driven with an engine; for such is the perfection of modern instruments, that they immediately betray any defect in the building, whether arising from the foundation, or superstructure.

The *building* should therefore be of solid and substantial masonry, particularly the transit room, which is the most essential apartment of an observatory. This room should, for the sake of firmness, be on the ground, and the pillars which support the instruments and clocks should be detached from the floor. It should of course possess a good view both north and south, and the opening or meridian aperture for observing through should command an uninterrupted view from the zenith to the horizon, in both directions; and the shutters or covers of the apertures should be opened and shut with ease by pulleys, or other ready methods. The proper width of the meridian apertures has been a subject of some doubt; but it is generally agreed that they should be wide enough for pointing the instrument conveniently to the heavens, and for admitting a ready supply of fresh air into the observatory, so as to render the internal temperature equal to the external; and if the shutters be divided into small openings, such may be occasionally useful to prevent a very hot sun from affecting the adjustment of the instrument.

With respect to the other apartments, their number must depend on the number of instruments to be used, whether

OBSERVATORY.

at the same time, or in succession. In most large observatories there is a dome raised for the equatorial or the circular instrument; for the plan of which, see *Rotatory Roof*.

As to the choice of instruments, and their convenient disposition, regard must be had to the plan of building; and the number must also depend on the same, as well as on the number of observations to be made. An observatory, however, cannot be considered as well furnished without the following apparatus: a transit instrument, or mural transit circle, with good clocks to shew both solar and sidereal time; and chronometers also are often useful. Mural quadrants or sextants may be likewise mentioned; but entire circles are greatly preferable, as they admit of various self-correcting adjustments, particularly when fitted up with revolving micro-

scopes. A portable reflecting circle should also form part of the apparatus, in order to measure angular distances in all directions, horizontal, vertical, and oblique. If there be a circular instrument that will measure both altitudes and azimuths, or an equatorial instrument, then a moveable dome will be necessary.

A zenith sector is likewise of importance, and of course good telescopes are essential, especially an achromatic with an equatorial movement and a micrometer eye-piece; also a powerful reflector for observing the phases of the sun, moon, and planets, as well as the satellites, nebulae, &c.

A particular description of the various instruments of an observatory will be found in this work, under their proper heads, with rules and examples for their use and application.

A TABLE of the Longitudes and Latitudes of the principal Observatories of Europe, as deduced from the most recent and accurate Determinations.

Names of Places.	Longitude from Greenwich in Time.			Latitude North.		
	h	m	s	°	'	"
Amsterdam - -	-	0	19 32	52	22	17
Armagh - - -	+	0	26 30	54	21	15
Berlin - - -	-	0	53 26	52	31	45
Blenheim - -	+	0	5 25	51	50	28
Bologna - - -	-	0	45 23	44	29	56
Bremen - - -	-	0	35 12	53	4	46
Breslaw - - -	-	1	8 11	51	6	30
Brunswick - -	-	0	42 8	52	15	29
Buda - - - -	-	1	16 10	47	29	44
Cadiz - - - -	+	0	25 10	36	32	1
Cambridge - -	-	0	0 17	52	12	36
Cassel - - - -	-	0	38 7	51	19	20
Coimbra - - -	+	0	33 37	40	12	30
Constantinople	-	1	55 41	41	1	27
Copenhagen -	-	0	50 18	55	41	4
Cracow - - -	-	1	19 44	50	3	52
Cremmunster -	-	0	56 32	48	3	29
Dantzic - - -	-	1	14 32	54	20	48
Dorpat - - -	-	1	46 55	58	22	48
Dresden - - -	-	0	54 50	51	3	9
Dublin - - -	+	0	25 20	53	23	14
Eisenberg - -	-	0	39 50	50	57	58
Florence - - -	-	0	45 3	43	46	41
Genoa - - - -	-	0	35 52	44	24	59
Glasgow - - -	+	0	17 4	55	51	32
Gotha (Seeberg) -	-	0	42 56	50	56	7
Gottingen - -	-	0	39 42	51	31	54
Greenwich - -	-	0	0 0	51	28	40
Highbury House -	+	0	0 23	51	33	30
Hyerès - - -	-	0	24 31	43	7	2
Leipfic - - -	-	0	49 28	51	20	44
Leyden - - -	-	0	17 55	52	9	30
Lilienthal - -	-	0	35 35	53	8	25
Lisbon - - -	+	0	36 34	38	42	50
London (Chr. Hof.)	+	0	0 24	51	30	57

Names of Places.	Longitude from Greenwich in Time.			Latitude North.		
	h	m	s	°	'	"
Madrid - - -	+	0	14 47	40	25	18
Manheim - - -	-	0	33 55	49	29	18
Marfeilles - -	-	0	21 29	43	17	50
Milan - - - -	-	0	36 45	45	28	2
Mirepoix - - -	+	0	7 30	43	5	19
Mittau - - -	-	1	34 51	56	39	6
Montauban - -	-	0	13 19	40	0	55
Montpelier - -	-	0	15 31	43	36	29
Moscow - - -	-	2	30 12	55	45	45
Munich - - -	-	0	46 20	48	8	20
Naples - - -	-	0	57 5	40	50	15
Nuremberg - -	-	0	44 17	49	26	55
Oxford - - -	+	0	5 2	51	45	38
Padua - - - -	-	0	47 32	45	24	2
Palermo - - -	-	0	53 21	38	6	44
Paris - - - -	-	0	9 21	48	50	13
Petersburg - -	-	2	1 13	59	56	23
Pisa - - - -	-	0	41 26	43	43	11
Portsmouth Academy	+	0	4 24	50	48	2
Prague - - -	-	0	57 41	50	5	19
Ratibon - - -	-	0	48 26	49	0	58
Richmond - - -	+	0	1 15	51	28	8
Rome - - - -	-	0	49 51	41	54	1
Slough - - -	+	0	2 24	51	30	20
Stockholm - -	-	1	12 13	59	20	31
Straßburgh - -	-	0	30 59	48	34	56
Toulouse - - -	-	0	5 46	43	35	46
Turin - - - -	-	0	30 40	45	4	14
Upfal - - - -	-	1	10 36	59	51	50
Utrecht - - -	-	0	20 27	52	5	12
Venice - - -	-	0	49 24	45	25	54
Verona - - -	-	0	44 1	45	26	6
Vienna - - -	-	1	5 31	48	12	36
Viviers - - -	-	0	18 41	44	29	13
Wilna - - -	-	1	41 10	54	41	2

Note. The sign - denotes East Longitude, and the sign + West Longitude, by which it is to be understood that addition or subtraction must be applied to the time of any given place, in order to find the corresponding time at the Greenwich Observatory.

OBSERVATORY, *Portable*. See EQUATOREAL.

OBSERVATORY *Island*, or *Padevoua*, in *Geography*, a small island in the South Pacific ocean, near the N.E. coast of New Caledonia. S. lat. $20^{\circ} 18'$. E. long. $165^{\circ} 40'$.

OBSERVATORY *Island*, a small island in the straits of Magellan, at the entrance of Bougainville bay.

OBSERVATORY *Point*, a cape on the N. coast of the island of Tongataboo. S. lat. $21^{\circ} 8'$. E. long. $184^{\circ} 55'$.

OBSERVATORY *Inlet*, an inlet on the W. coast of North America, where Capt. Vancouver made his observation; extending about 32 miles, N. lat. $54^{\circ} 58'$. E. long. of the entrance $230^{\circ} 6'$.

OBSESSION, an action, or rather passion, of being beset by an evil spirit; which, without entering the body, torments, and, as it were, besieges the person without. In which sense, obsession differs from possession.

The marks of obsession, according to some, are a being hoisted into the air, and thrown violently down without being hurt; speaking languages never learnt; having an aversion to all acts and offices of religion, &c.

Some physicians look on all cases of obsession as natural, and curable by natural medicines, particularly by an unguent, called *unguentum corrobiteri*; with purgatives, or vomitives.

Of this opinion is Dr. Gabriel Clauderus, member of the Leopoldine Academy, which he confirms with the testimony of Fromannus, in his treatise "De Fascinationibus," and Gansius de Corallis; adding, that it has been confessed by many witches and forcerers, that the plant hypericon, and other simples, &c. incommode them terribly, and prevent their operations.

He confirms this sentiment hence, that the devil, in those he thus besets, makes use of the melancholic humour, or the atra bilis, and the grosser impurities of the blood, without always acting immediately of himself. For which he refers to the books of Melchior Sebiziuz, and Jerom Jordan "De Divino in Homine;" and gives the process of a cure of a manifest obsession of a child of a year old at Delitschebourgh, three leagues from Leipzig. In truth, the devil hath no share in the matter. See DEMONIAL Possession.

OBSIDIANUS LAPIS, in the *Natural History of the Ancients*, the name of a stone which they have also described under the name of the *China marble*. It is very smooth and hard, extremely difficult to cut, but capable of a fine polish, and was used among the ancient Greeks for the making of reflecting mirrors.

The later writers have supposed the name obsidianus derived from somebody of the name of Obsidius, who was the inventor of this use of it; but it seems only a false spelling of the word *opsianus*, *απο της οψος*, from seeing the images of things in it.

The obsidian, or Iceland agate, occurs in masses, and also in rough, roundish, detached pieces. Its specific gravity is 2.34. The obsidian of Iceland has been decomposed by Bergman, and more recently by Abildgaard, with the following results:

Berg.		Abild.
69	-	74 Silix
22	-	2 Alumine
9	-	14 Oxyd of iron.
—	—	—
100		90
—	—	—

The hardness and opaque blackness of this mineral, added to the high polish of which it is capable, have caused it to be employed for various kinds of ornaments. In Peru, at

the time of its conquest by the Spaniards, it was used for mirrors, and has been fashioned in Europe into reflectors for telescopes. See AGATE and LAVA, Clafs 10.

OBSDIONALIS, an epithet which the Romans gave to a sort of crown with which they honoured such of their generals as had delivered a Roman army, or fortrefs, besieged by the enemy; and had raised the siege, or obliged them to decamp.

The word comes from the Latin *obsidio*, *siege*.

It was also called *graminea*, because made of grafs or herbs found on the spot or soil.

It was the soldiery who bestowed this crown; which, doubtless, was the reason of its not being of a more precious matter.

OBSKAIA, in *Geography*, a gulf or bay of Russia, in the Frozen ocean, about 360 miles in length, and from 44 to 60 in breadth. N. lat. $66^{\circ} 40'$ to $72^{\circ} 15'$. E. long. 72° to 76° .

OBSTACLES to *Cultivation of Land*, in *Agriculture*, any sort of impediments placed in the way of its improvement. These are of various kinds, such as arise from too much water below or on the surface of the ground, and which can only be removed by suitable kinds of draining; from the growth of wood either of the strong or more shrubby sorts, and which can only be made capable of cultivation, by being wholly cleared away and destroyed both in the root and top; and from stones of the rocky or other descriptions, either lying below or above the surface of the ground, and which require to be wholly, or in a great part, removed before any sort of cultivation can be attempted. All these, and various others of a less obvious tendency, are frequently met with by the cultivator, and often oppose considerable obstruction to the progress of his improvements, in bringing land into the state of cultivation. See DRAINING.

But though these are some of the principal obstacles that present themselves from the nature of the lands themselves; there are others which arise from the nature of the tenure or manner in which they lie or are held, and various other causes which do not depend upon the land. These have been stated by Dr. Robertson, in his *Agricultural Survey of the County of Perth*, to be, first, *townships*, by which he means a number of *plough-gates* in one village, or several tenants about one plough; secondly, the custom of *runrig*, or an intermixture of property; thirdly, the *uncertain boundaries* of estates; fourthly, the feudal custom of servitudes, which are productive of various ill consequences; fifthly, the custom of thirlage to mills; sixthly, the *shortness* of leases; seventhly, the *distance* from manure; and eighthly, *commons*, or lands in the state of commonage. But besides these, the taking of tithes in kind, and some other claims upon land, operate unfavourably to their cultivation. The particular methods in which these different causes operate in preventing the cultivation of lands, will be explained in speaking of the several heads to which they particularly relate.

ORSTETRICAL ART, the art of midwifery. See DELIVERY, and LABOUR.

OBSTITA, among the Romans, a term used to signify places that had been thunder-struck, which were otherwise called *bidentalia*. See BIDENTAL.

OBSTRUCTION, in *Medicine*. Any tumour or collection of matter, natural or morbid, which occasions an impediment to the regular performance of the functions of any organ in the body, is said to be an obstruction. Such are the accumulation of excrement in the intestinal canal, or of bile in the ducts of the liver; the effusions of serum in various cavities of the body, constituting hydrothorax, ascites, and other

other species of dropsy; and the occurrence of all large tumours in the viscera, which, by pressure upon the contiguous organs, interrupt and derange their action. All chronic enlargements of the glands and other parts tend, by such pressure, to obstruct the proper circulation and excretion of the fluids, and therefore to produce various secondary or symptomatic diseases. Thus scirrhus tumours of the mesentery, pancreas, or of the liver itself, by pressing upon the vena portæ, or great vessel of the liver, are liable to produce dropsy of the belly, in consequence of impeding the circulation of the blood through the vessels of the abdomen, which therefore pour out the thinner or watery part of the blood into the cavity of the belly, from their exhalant extremities. The same tumours, if they press upon the bile-ducts, will impede the flow of the bile into the intestines, and occasion jaundice. In a similar manner, the functions of the lungs, heart, kidneys, brain, and every other organ of the body, are deranged by obstructions, occurring within their own substance, or in the adjoining parts.

As obstructions are seated in organs of various structure, and consist of diseased changes of various nature, the proper treatment of the diseases which they produce, can only be directed with success, after a careful and skilful investigation of the various symptoms connected with them. The connection of certain symptoms, with certain organic derangements of the internal parts, is learnt by an observation of the functions, which are particularly disordered, aided by the knowledge acquired by previous examinations of the diseased organs after death, and by a comparison of them with the symptoms that had occurred during life. Hence the study of what is called morbid anatomy is of great importance in enabling the physician to ascertain the nature of diseases originating from organic obstructions; and it must be obvious, that the universal administration of any particular remedy, as a deobstruent, will be often altogether useless, and not unfrequently injurious.

The various diseases, originating from obstruction, will be found under their respective heads. See DROPSY, JAUNDICE, MARASMUS, &c.

OBSTRUENTS. See DEOBSTRUENT.

OBSTRUXIT, *Quare* OBSTRUXIT. See QUARE.

OBTUNDENTIA, a word used by some authors to express such medicines as are given to obtund, or edulcorate the acrimony of the humours.

OBTURATOR, in *Anatomy*, an epithet applied to the large oval opening in the front of the os innominatum, and to various parts situated near it. The opening is called the obturator foramen; the ligament which occupies it, an artery, a vein, a nerve, and two muscles, have the same epithet.

The *obturator externus* (sous-pubo-trochanterien externe) is a muscle of a triangular figure, situated at the upper and inner part of the thigh, and extending from the foramen ovale of the pelvis to the great trochanter. It arises from the anterior part of the bone forming the foramen ovale, and from the neighbouring portion of the obturator ligament. It grows narrower, and passes outwards and backwards, lying on the obturator ligament, on the ischium, and on the orbicular ligament of the hip. It then ascends behind the neck of the femur, and is fixed by a tendon to the lower part of the internal surface of the great trochanter, adhering firmly to the orbicular ligament. It is covered in front by the pectinalis, the adductors, and the quadratus. The upper edge is rather concave, and extends obliquely from within outwards, and from above downwards, from the pubes to the great trochanter: the obturator vessels and nerve come over it towards the inside, and it is connected, on the outside,

by cellular tissue, to the orbicular ligament. The inferior margin is nearly transverse in its direction. The posterior surface covers the obturator ligament, and a part of the bone.

This muscle is fleshy at its origin, and in most of its substance; but its attachment to the trochanter is tendinous.

It rotates the thigh-bone outwards, and draws it towards the opposite limb.

The *obturator internus* (sous-pubo-trochanterien interne) is another muscle of the thigh, very similar to the former in size and direction, but placed within the cavity of the pelvis. It is flattened and triangular in its figure, and reaches from the foramen ovale to the trochanter major. It arises from the upper, lower, and internal edge of the foramen ovale, and from the obturator ligament. The fibres converge and form a tendon, which turns round the bone in the groove between the tuberosity and spine of the ischium, and passes out of the pelvis at the lesser sacro-sciatic foramen. It then runs from within outwards, between the two gemini, which almost entirely cover it behind, and terminates by an insertion in the back of the trochanter major.

The internal surface of this muscle is covered by the levator ani, and the pudendal vessels; the external covers the obturator ligament, and a part of the ischium. On the outside of the pelvis, the tendon lies upon the ischium and the hip-joint, with the gemelli more or less closely adhering to it.

An interval is left between two portions of the muscle, at its origin, and gives passage to the obturator vessels and nerve.

The origin is fleshy, and comparatively broad; the muscle has become narrow where it turns round the ischium, and it is still narrower on the outside of the pelvis, where it is almost entirely tendinous. A very well-marked bursa mucosa covers the tendon and bone, where the former turns over the latter. The surface of the bone is covered by cartilage, over which, and over the corresponding surface of the tendon, a synovial membrane is extended. This bursa extends some way into the pelvis. From the sharp turn which the muscle makes over the bone at this part, the rubbing in its action must be very considerable: we find the bone here marked by several ridings, corresponding to divisions in the tendon.

The obturator externus rotates the thigh-bone outwards: when the hip is bent, it will separate the thigh from the opposite limb.

OBTUSE literally imports blunt, dull, &c. in opposition to acute, sharp, brisk, &c.

OBTUSE Angle, in *Geometry*. See ANGLE.

OBTUSE-Angled Triangle, is a triangle, one of whose angles is obtuse.

OBTUSE-Angular Section of a Cone, a name given to the hyperbola by ancient geometers, because they considered it only in such a cone, whose section by the axis is a triangle, obtuse-angled at the vertex. See CONIC Sections, and HYPERBOLA.

OBTUSE Appui. See APPUI.

OBVA, in *Geography*, a river of Russia, which runs into the Kama, near Obvinsk.

OBVENTIONS, OBVENTIONES, in *Ancient Law Books*, signify the produce of a benefice, or spiritual living; including oblations, tithes, rents, and other revenues.

OBVINSK, in *Geography*, a town of Russia, in the government of Perm, on the Kama; 60 miles N. of Perm. N. lat. 58° 44'. E. long. 56° 14'.

OBY, or OB, the largest river in the Russian empire, answering to its name, which signifies "Great," originates properly

properly in the Chinese Soongoria, from whence it issues in a copious stream, under the appellation of Tshulishman; and in N. lat. 52° , and E. long. $103^{\circ} 30'$, falls into the lake Teletzkoe, in the Russian territory. From this lake, called by the Tartars Altinkul, or Altyn, it flows out again under the name of By, not taking that of Oby until its junction with the Katunya. In its upper regions it has a strong current, and several cataracts, and particularly a great number of islands, mostly in the circle of Berofof. At N. lat. 67° , and long. 86° , it discharges itself into the gulf of the same name, which unites it with the Frozen ocean in N. lat. $73^{\circ} 50'$, and long. 90° . The principal rivers which the Oby takes up in its course are to the left, the Katunya, the Tsharysh, the Alei, the Irtysh, the Konda, and the Sofva; to the right, the Tshumysh, the Tom, the Tshulym, the Ket, and the Voch. Up as far as the mouth of the Ket, the Oby has mostly high and rocky shores; but farther on, quite to its entrance into the Frozen ocean, it, generally speaking, flows over a clayey, sandy, and marly bed. It is navigable till very near up to the Teletzkoe-Ozero, uncommonly prolific in fish, and in many places is accompanied by forests of large pine and birch trees. The course of this river extends above 3000 versts. Tooke's Russia, vol. i.

OBY, or *Ouby*, a small island in the East Indian sea; 50 miles in length from E. to W., and from 12 to 20 in breadth. S. lat. $1^{\circ} 36'$. E. long. $124^{\circ} 56'$.

OBY, *Little*, a small island near the W. coast of Oby. S. lat. $1^{\circ} 26'$. E. long. $127^{\circ} 12'$.

OCADH, a town of Arabia, in the province of Hedsjaz; 30 miles N.E. of Niab.

OCAMPO, FLORIAN DE, in *Biography*, a person of whom little is known, except what is learnt from a petition which he presented to the Cortes of Valladolid, a few months before his death. In this petition he stated, that for twenty-eight years he had been employed upon the Chronicle of Spain, in consequence of which he had been appointed chronicler to the emperor Charles V. in 1539. In 1547 he was made a canon of Zamora, but the duties of this station deprived him of all leisure for literary pursuits, and he therefore petitioned for a pension of 400 ducats, being equivalent to the value of the preferment. This was favourably received, but Ocampo did not live to receive it. He took great pains in travelling through many countries in quest of documents for his history, and boasts of having copied every inscription in Tarragona with his own hand. He says, he went down into the mine near Carthagen, not without risk to his person. He had travelled abroad, and was once driven by storms on the coasts of Ireland. His chronicle only comes down to the death of the Scipios. After relating the fall of Syracuse, Florian devotes a whole chapter to Archimedes; in this, he says, he wished to indulge his own feelings, "because it seems to me, that if chroniclers would look to this, it would be a more fitting thing to record in histories, the remembrance of persons so useful to the world, so worthy to have their inventions and benefactions praised by us all who come after them, than the cruelty and fierceness of so many battles, so much strife and rancour, such waste of blood as we find to be their main subject of relation, being manifestly things injurious to our nature, and which should be lightly related, or passed over in silence, as of bad example, when not called forth for the support or defence of virtue, or of princes and good rulers, whom God commands us to regard in his place." Florian speaks of a work that he designed to write upon mechanical inventions, which he had seen in his travels, and on some of which he had improved, with the view of setting forth the manner to be used in making them, and afterwards

the reason and causes of all their effects and circumstances, conformable to the principles of natural philosophy. This writer is said to have rendered more service to Spanish literature, as an editor, than as an author. During his residence at Zamora, the printers of that city applied to him for something to write, which they might publish for the use and glory of the kingdom. He fortunately had in his possession the General Chronicle of Spain, which had been compiled by Alfonso the Wise, which he gave them for the press, and he corrected the proofs with great care, and the most scrupulous fidelity. This edition was completed in December 1541, and is a very fine black letter book. There is a Valladolid edition of it of 1604, but the work is very rare. This author, says Mr. Southey, was born in 1499, and died in 1555. His father's name was Lope de Ocampo, who was natural son of D. Diego de Valencia, by Sancha Garcia de Ocampo. Gen. Biog.

OCANNA, in *Geography*, a large and antique city of Spain, and chief town of Lower Mancha, situated on an eminence on the side of New Castile and La Mancha, at the entrance of the plain of La Mesfide Ocanna. This place was formerly very strong, and the remains of the old walls are still visible. It belonged for some time to the order of Calatrava; and was afterwards transferred to the knights of St. James, to whom it now belongs. In later times it has lost much of its splendour, and is now partly in ruins. Ocanna contains four parishes, six monasteries, five convents, a governor of the order of St. James, and an Alcade mayor. The inhabitants formerly carried on a considerable trade in gloves; it had 72 manufactories, and 103,480 dozen pair were said to be made every year; but the importation of this article has put a stop to that branch of industry and commerce. It has now only one manufactory of leather for shoe-soles, and four of hard soap. The church of the Carmelites is the only edifice worthy of notice. One of its two fountains is grand and noble; and, as some suppose, was built in the reign of Philip II., but others think it more probable, that it was constructed at the time when the grand masters of St. James, then so rich and powerful, lived at Ocanna; and, therefore, at a much earlier period than the reign of Philip II. The number of inhabitants is about 2000; 25 miles E.N.E. of Toledo. N. lat. $40^{\circ} 1'$. W. long. $3^{\circ} 47'$.

OCANNA, or *St. Anna*, a town of South America, in the province of St. Martha, on the Rio di Oro; 220 miles S. of St. Martha. N. lat. $7^{\circ} 50'$. W. long. $73^{\circ} 26'$.

OCCA, a ridge of mountains in Spain, being one of the principal ramifications of the Pyrenees, extending from the vicinity of Tortosa in Catalonia, to Burgos in Old Castile.—Also, a river of Spain, which rises near Burgos, and runs into the Ebro near Frias.

OCCACOCKE, an island near the coast of North Carolina; 10 miles long, and from $1\frac{1}{2}$ to 3 wide. N. lat. 36° . W. long. $76^{\circ} 12'$. A channel between this island and Cove bank is called Occacoke inlet. N. lat. $34^{\circ} 55'$. W. long. $76^{\circ} 18'$.

OCCAM, WILLIAM, in *Biography*, an English scholastic divine of the 14th century, was a disciple of Dun Scotus, to whom he was little, if at all, inferior in subtlety, and obtained the title of the "Invincible Doctor." He became a member of the order of Cordeliers, the general of which appointed him to write against pope John XXII.; the result of this was the work entitled "De potestate Ecclesiastica et Seculare," in which he boldly opposed the tyranny of the papal over the civil power. He was obliged, in consequence of this piece, which exposed the encroachments of the Roman see, and the corruptions of the monks, to be taken

take himself to flight. He escaped from Avignon in 1327, and proceeded to Munich, where the emperor then was whose protection he sought. Under his auspices he again maintained the independency of the civil power, with respect to the ecclesiastical. He was joined by others, but Occam surpassed them all in the keenness and spirit of his satire, and hence it is thought that his "Dialogues between a Master and Scholar," and his other pieces intended to expose papal tyranny, were perused with avidity, and had no little effect in preparing the way for the downfall of the ambition and greatness of the popes. This opposition to the see of Rome drew down upon Occam a sentence of excommunication, but he continued to live in security in the emperor's court, where he died in 1347. He was author of many works besides those already referred to, particularly of "Commentaries" on some of the pieces of Porphyry, Aristotle, and the sentences of Peter Lombard. They were collected in 1476, and published at Paris in two volumes folio. *Enfield's Hist. Phil.* vol. ii.

OCCASIO, in *Ancient Law Writers*, denotes a tribute which the lord imposed on his vassals, or tenants, on occasion of war, and other exigencies.

OCCASIONAL CAUSE, &c. See **CAUSE**, **EFFICIENT**, &c.

OCCATION, a term in the ancient husbandry, by which they expressed what we do by harrowing, though they performed it with a different instrument, a kind of rake. With the teeth of this instrument they levelled the ground, and broke the clods, and, with the hand, strewed the corn over this level ground. Then they brought on the plough, and ploughed it in; so that the grain was sown in furrows, as we express it, and usually came up, as we see it does at this time with us, in the same case, in the lower parts only. After it had got a few leaves, they went over the ground again with the same instrument a second time, to clear away the weeds, and move the earth about the roots of the young plants. If they did this lengthways of the furrows, the earth being somewhat hardened, there fell but little of it among the corn; but if they did it crossways of the furrows, a great deal fell down upon, and among, the young plants, and, in a manner, buried them: they were usually observed to grow better for this cross harrowing, except in cold places; and the husbandmen thought the vigour of the plants was owing to the burying them with new earth; but this was really rather prejudicial to them, and the advantage they had arose from the more deep stirring of the ground. *Tull's Husbandry*.

OCCHIO, in *Glass Making*, the hole of the floor of the tower of the leer.

OCCIDENT, in *Geography*, the westward quarter of the horizon, or that part of the horizon where the ecliptic, or the sun therein, descends into the lower hemisphere.

OCCIDENT, *Equinoctial*, that point of the horizon where the sun sets, when entering Aries or Libra.

OCCIDENT, *Estival*, that point of the horizon where the sun sets at his entrance into the sign Cancer, when the days are longest.

OCCIDENT, *Hybernal*, that point of the horizon where the sun sets, when entering the sign of Capricorn; at which time, the days, with us, are shortest.

OCCIDENTAL, a term chiefly used in commerce, to distinguish commodities brought from the West Indies, *i. e.* America, from those brought from the East Indies, which are said to be *oriental*.

In this sense we say, *occidental bezoar*.

OCCIDENTAL Pearl. See **PEARL**.

OCCIDENTAL Horizon. See **HORIZON**.

OCCINIANO, in *Geography*, a town of France, in the department of the Marengo; seven miles S.W. of Casala.

OCCIPITALIS, in *Anatomy*, an epithet applied to the parts situated about the occiput, as an artery, vein, nerve, &c.

OCCIPITALIS Musculus. See **EPICRANIUS**.

OCCIPITIS Os, a bone of the cranium. See **CRA- NIUM**.

OCCIPITO-FRONTALIS, a muscle of the scalp. See **EPICRANIUS**.

OCCIPUT, the back of the cranium, forming the protuberance immediately above the neck; or the particular bone forming that part of the skull.

OCCOA, in *Geography*, a bay on the S. side of the island of St. Domingo, into which fall the rivers Sipicepy and Ocoa. It lies E. of Neybe or Julienne bay, and is bounded S.E. by point Salinas, and W. by the E. point at the mouth of Bya river.

OCCOA, a bay near the E. coast of the island of Cuba, in the Windward passage, about 20 miles E. of Guantanamo bay.

OCCOCHAPPY, or *Bear-Creek*, a river of America, in the Mississippi territory, which discharges itself through the S.W. bank of Tennessee river, just below the Muscle shoals. From this creek to the navigable waters of Mobile river, there is portage of about 50 miles.

OCCONEACHEA ISLANDS, two long narrow islands at the head of Roanoke river, in Virginia, just below where the Staunton and Dan unite and form that river.

OCCULT, something secret, hidden, or invisible. The occult sciences are, magic, necromancy, cabbala, &c.

Agrippa has several books of occult philosophy, full of the vainest, wildest dreams imaginable: and Fludd nine volumes of the cabbala, or occult sciences, wrapt up under figures or Hebrew characters.

Weak philosophers, when unable to discover the cause of an effect, and unwilling to own their ignorance, say, it arises from an occult virtue, an occult cause, an occult quality.

OCCULT, in *Geometry*, is used for a line that is scarcely perceivable, drawn with the point of the compasses, or black-lead pencil.

OCCULT, or dry lines, are used in several operations; as the raising of plants, designs of building, pieces of perspective, &c. They are to be effaced when the work is finished.

OCCULTATION, in *Astronomy*, the time a star or planet is hid from our sight, by the interposition of the body of the moon, or of some other planet. See **ECLIPSE**.

OCCULTATION, *Circle of Perpetual*. See **CIRCLE**.

OCCUPANT, in *Law*, he that first seizes and takes possession of a thing.

If a tenant hold land, &c. for the term of another's life, and such tenant die first, without making any estate of it; he that first enters to hold that term out, is said to acquire a property: and is called an occupant, by reason his title comes by the first occupation.

So if a tenant, for his own life, grant over his estate to another; if the grantee dies before him, there shall be an occupant.

OCCUPATION, or **OCCUPANCY**, in the *Civil Law*, denotes the possession of such things as at present properly belong to no private person, but are capable of being made so. As, by seizing or taking spoils in war; by catching things wild by nature, as birds, and beasts of game, &c.; or by finding things before undiscovered, or lost by their proper owners.

OCCUPATION is also used, in *Common Law*, for the putting a man out of his freehold in time of war.

Occupation amounts to the same with disseisin in time of peace; only that the former is deemed not so great an offence. See **DISSEISIN**.

OCCUPATION is also used for holding tenure, or possession. As, when we say, such land is in the tenure or occupation of such a man; that is, in his possession.

OCCUPATIONS, in the statutes De Bigamis, denote usurpations upon the king, by using liberties or franchises a person is not entitled to.

As an unjust entry upon the king into lands and tenements is called an *intrusion*; so an unlawful using of franchises is called an *occupation*.

OCCUPATION-BRIDGES in a canal, are also called swing, swivel, or draw-bridges, and they are made for the private use of persons whose lands adjoin the canal.

OCCUPAVIT, in *Law*, a writ which lies for him who is ejected out of his land, or tenement, in time of war; as a novel disseisin lies for one ejected in time of peace.

OCCUPIERS of Walling, a term in the salt-works for the persons who are the sworn officers, that allot, in particular places, what quantity of salt is to be made, that the markets may not be over-stocked, and see that all is carried fairly and equally between the lord and tenant. These persons always appoint how many houses shall work at a time; and when there is salt to be made, these appoint a cryer to proclaim it to all the workers, that they may put to their fires at the same time; and a like proclaiming of the time when they shall leave off; and those who continue to work after this prohibition, are to have their salt spoiled or destroyed.

OCDA, in *Geography*, a town of Persia, in the province of Irak; 150 miles E.S.E. of Ispahan.

OCEAN, the vast collection of salt and navigable water which encompasses the whole globe of the earth.

The word comes from the Latin *oceanus*, of the Greek *ωκεανος*, which Eustathius derives from *ωκεανος* *ωκεανος*, to slide swiftly; others say, the Greeks borrowed it from the Phœnicians, who called the circumference of the ocean, *og*; from the Hebrew *חֶגְגֵּל*, *hag*, circuit, ambit.

The ocean is that huge body of waters, in which the two grand continents known to us, the new and old, are inclosed like islands.

By computation, it appears that the ocean takes up considerably more of what we know of the terrestrial globe than the dry land: and recent discoveries have evinced that more than two-thirds of it are covered with water.

Dr. Keill computes the surface of the whole ocean to be 85490506 square miles: so that supposing the depth of the ocean, at a medium, to be $\frac{1}{4}$ th of a mile, the quantity of water in the whole will be 21372626 $\frac{1}{2}$ cubic miles. See **GLOBE**, and **Magnitude of the EARTH**.

Yet Dr. Burnet computes that all the waters in the ocean were not sufficient to drown or overflow the dry land so high as the scriptures say it was at the deluge: seven or eight oceans, according to him, would scarcely have sufficed.

The ocean, penetrating the land at several streights, or straits, quits its name of ocean, and assumes that of *sea*, or *gulf*; to which are usually added some epithets, to distinguish it: as Mediterranean sea, Persian gulf, &c. In very narrow places it is called *streights*, *sinus*.

The ocean takes divers names, according to the divers countries on which it borders: as the British ocean, German ocean, &c. According to Maty, the ocean may be com-

modiously divided into *superior*, or *upper*; and *inferior*, or *lower*.

OCEAN, Upper, which the ancients called the *exterior*, as environing all the known parts of the world, he subdivides, according to the four cardinal points, into the *northern*, *southern*, *eastern*, and *western*.

OCEAN, Northern, called also the *glacial*, *frozen*, and *Scythian*, is that part of the upper ocean next the north pole; bounded on the south with the arctic circle, (hence called the *Arctic* ocean,) and the northern coasts of Europe, Asia, and America; and on the north with the unknown lands about the pole.

It is called the *icy* or *frozen* ocean, because those who have attempted a passage through it to China, &c. have always been stopped with the ice: and *Scythian* ocean, because it washes the coasts of Scythia. See **FROZEN Ocean**.

OCEAN, Western, or *Atlantic*, is that part of the grand ocean which washes the western coasts of Europe and Africa, and the eastern of America, extending from the arctic circle to the equinoctial: or, more generally speaking, is that which separates the ancient continent from the new.

OCEAN, Southern, or *European*, is that part reaching from the equinoctial to the unknown antarctic lands. That part of this ocean which lies between the antarctic circle and the southern pole is called the antarctic ocean, and is in fact only a continuation of the Pacific, Atlantic, and Indian oceans.

OCEAN, Eastern, or *Indian*, has its first name from its situation to the east; and its latter from India, the chief country it washes. It reaches from the coast of Ajan to the Isle aux Latrons, i. e. of *Thieves*.

It washes the shores of the eastern coast of Africa, and the south of Asia, and is bounded on the east by the Indian islands, and the southern continent.

OCEAN, Inferior, or *American*, is that vast part of the grand ocean, which washes the coast of America; unknown, in great measure at least, to the ancients. It is divided into three parts, viz.

The *North sea*, which washes the eastern coast of America, from the arctic circle to the tropic of Capricorn.

The *Magellanic sea*, extending from the tropic of Capricorn to the Terra australis incognita.

The *South sea*, or *Pacific*, which washes the western coasts of America to the east, as far as the isle of Thieves; and from south to north, from the tropic of Capricorn to the land of Jessu.

The *Pacific* ocean, in its whole extent, occupies nearly half the surface of the globe, from the eastern shores of New Holland to the western coast of America. This ocean is diversified with several groups of islands, which appear like the summits of vast mountains emerging from the waves. See **PACIFIC Ocean**.

OCEAN, for the Saltiness of the, see **SALTNESS**.

OCEAN, for the Tides observed in the, see **TIDES**.

Phil. Sachtius, in 1664, printed a dissertation, intitled "Oceanus Microcosmicus," dedicated to Bartholine; wherein he shews that there is a circular motion in the waters, like that of the blood in the human body; that they all come from the ocean, and return thither again. The thought is Solomon's, Eccles. xii. See **VAPOUR**, **SPRING**, &c.

OCELLATI LAPIDES, in *Natural History*, a name given by the ancients, sometimes to express certain stones found on the shores, and in the beds of rivers, and naturally marked with the figure of an eye; and sometimes for small round stones of the shape of the groove of the eye, made by art for children to play with, and of the nature of what

we call marbles. Suetonius tells us, that Augustus Cæsar used sometimes to divert himself with playing *nucibus et ocellatis*.

The word *lapidibus* is understood after the last word, and the meaning of the author plainly is, that he played like a boy, with nuts and marbles. But we have abundant testimony among the ancient naturalists of the word having been used also as the name of the gem which we now call *oculus beli*, and all those other stones of the agate, or other semipellucid kinds, which had the figure of an eye naturally impressed upon them, that is a round spot of a different colour, in the centre of a small roundish stone. These were scarce among the ancients, because they had none but the true *oculi beli*, or such stones as were of a particular species, and were found naturally of the shape and size of an eye; but we have them much more common, because our jewellers, whenever they find a natural spot in an agate, surrounded with a white circle, cut it out from the rest of the stone, and sell it as a natural *oculus beli*.

OCELLUM, in *Ancient Geography*, a promontory of Britain, generally supposed to be Spurn-head; and Mr. Baxter, with great probability, thinks the name is derived from the British word Ochel (Uchel) lofty. There is a very lofty mountain in Scotland, called Ocelli-mons, Ochill-hills, for the same reason.

OCELLUS, in *Biography*, an ancient Greek philosopher of the Pythagorean school, was a native of Lucania, whence the surname of the *Lucanian* is commonly given to him. The time in which he flourished was the age before Plato, which is inferred from a letter preserved by Diogenes Laertius, in which Archytas informed Plato that he had received several pieces written by Ocellus, from his grandsons. Among these was a treatise "Of Laws, or Kings and Kingdoms," of which a few fragments only remain, which are preserved by Stobæus. Another of his works was a book "On the Universe," which has come down to us entire; this has been supposed by Thomas Burnet to have been compiled from the writings of Aristotle, and he regarded it as an epitome of the Peripatetic doctrine concerning nature, but others pronounce it to have been in existence long before the time of Aristotle, and that this philosopher borrowed many things from Ocellus, but made use of them in a sense very different from that of their original author. A summary of the doctrine taught by Ocellus is given by Dr. Enfield in his abridgement of Brucker, vol. i. to which we refer our readers. It is a specimen of the Pythagorean doctrine, intermixed with tenets peculiar to the author. He maintained that the universe never had a beginning, nor will have an end; that the world, in its present beautiful form, is to be distinguished from the universe of which it is formed; and that the collection of all beings which forms the world is itself perfect and entire, and has no connection with any thing extrinsic. The immutable essences of Ocellus are the same with the intelligible natures of Pythagoras (see PYTHAGOREAN *System*); and the doctrine of Ocellus concerning dæmons, that they inhabit the sublunar regions, is essentially different from that of Aristotle, who supposed no such intelligences, except in the celestial sphere. The work of Ocellus here referred to, was first printed in Greek at Paris in 1539; and at Venice in Greek with a Latin version by Lewis Nogarola in 1559: it has since gone through many editions, of which the most valuable is said to be that of Dr. Thomas Gale, with the version of Nogarola, and learned notes, in his "Opuscula Mythologica," printed at Cambridge in 1671. Moreri. Enfield's Hist. Phil.

OCELLOT of Buffon, in *Zoology*, called by others the

Mexican cat, and by Hernandez *tlacoozelotl*, is a species of cat, or *FELIS Pardalis* of Linnæus; which see.

This animal inhabits Mexico, the neighbourhood of Carthage, and Brazil; lives in the mountains; is very voracious, but fearful of mankind; preys on young calves, and different sorts of game; lurks amidst the leaves of trees; and sometimes extends itself along the boughs, as if dead, till the monies, approaching to examine it, become its prey. Penant.

OCHAGAVIA, in *Geography*, a town of Navarre; 23 miles E. of Pamplona.

OCHAN, a town of Russia, in the government of Perm, on the Kama; 20 miles S.S.W. of Perm. N. lat. 57° 28'. E. long. 54° 30'.

OCEL, a river of Silesia, which runs into the Oder; nine miles below Beuthen.

OCHIL HILLS, an extensive range of mountains in Scotland, commence in the parish of Dumblane, Perthshire, and passing through Clackmannanshire, along the north bank of the river Forth, stretch for many miles into the county of Fife. These hills rise, for the most part, abruptly from the valley, on their southern side, and in some places their ascent is almost perpendicular. The whole ridge may be characterised as covered with green, to its highest summit. The more gentle slopes abound with villages, hamlets, and farm-houses, sometimes skirted by woods, and sometimes entirely enveloped in their umbrageous shade. The highest hill of the Ochils is Bencleugh, which, according to Mr. Stobie, is 2450 feet in height. From the summit, the prospect is extremely fine and extensive, as no height intervenes even to the German ocean, and the country it overlooks is, in general, fertile and well cultivated. From some points the spectator has a most remarkable view of the Carries of Stirling and Falkirk, with the river Forth meandering through them. On a peninsulated rock in the centre of a deep glen in this part of the ridge, provincially denominated the Alva-hills, stand the venerable ruins of Castle-Campbell, belonging to the family of Argyle. From its solitary and darksome situation, this pile was called the Castle of Gloom; and all the names of the adjacent places were, and still are, suitable, being seated in the parish of Dolor, washed by the stream of Sorrow, and enveloped by the glens of Care. It was destroyed in 1645 by the marquis of Montrose, who carried fire and sword through the whole estate, with such inhuman cruelty, that he only left one house unconsumed, which he erroneously supposed to belong to a neighbouring baron. The castle was anciently supplied with water by means of a secret stair cut downwards through the solid rock to one of the adjoining rivulets. This passage is six feet wide, and from its situation, overhung with impending rocks and trees, is frightful even to look into. It is called by the inhabitants Kemp's score, or cut, from having been formed, as tradition relates, by a person of that name, to whom the fortrefs is said to have originally belonged.

The Ochil hills are composed of red and grey granite, whinstone, and various kinds of schistus, and contain numerous veins of the more useful minerals. Some portions of them exhibit traces of a volcanic origin, great quantities of lava being discovered on their sides, or lying in immense masses in the vale below. In the western division of these hills an attempt was made to work a silver mine, but after four years continuance the work was abandoned as unprofitable. This happened in 1761, but previous to that period a valuable stratum of the same metal was discovered in the glen that divides the Middle-hill from the Wood-hill, above the parish of Alva. It was first perceived in small strings of

silver

silver ore, which, being followed, conducted the workmen to a rich mass of, what is commonly called, virgin silver. The produce of this vein was no less than twelve ounces of the pure metal from fourteen ounces of ore. The expence of the discovery did not exceed 50*l.*; and during fourteen weeks the quantity raised weekly amounted to more than 40,000*l.* sterling in value. When this mass, however, was exhausted, the silver disappeared, and lead and other minerals were found in its stead, upon which the search was given up for many years. But being renewed in 1759, a pit was sunk below the spot whence the rich collection of ore was extracted, when another mass of metal was laid open, which was at first supposed to be silver, though, on further examination, it proved to be the semi-metal called cobalt, which is used in forming the blue glazings of china-ware, and in giving a blue colour to glass. The cobalt of Alva was tried at Preston-Pans works, and found to be equal in quality to that with which Europe is, in general, supplied from the mines of Saxony. Unhappily, however, the mass of this mineral, like that of the silver, was soon exhausted, and though small quantities of it have since been discovered in various parts of the Ochils, it has never again appeared in sufficient abundance to render it an object of commerce. The other metals found on these hills are copper, lead, and iron. About fifty years ago a copper mine was wrought in what is called the Mill-Glen, by an English company. The thickest stratum or vein measured about 18 inches; and four different strata were traced. Iron-stone is very abundant in the Clackmannan district, and, in consequence, an extensive iron-work has been established in the vicinity of that town under the firm of the Devan company. The vale at the foot of the Ochils, on the south side, may be regarded as one vast field of coal, which forms the most important article among the exports of this part of Scotland.

Mr. Charles Mackenzie has lately communicated to the "Wernerian Natural History Society," a mineralogical description of these hills. The rocks of which they are composed, arranged according to their situation and relative antiquity, the lowest and oldest being the first mentioned, and the uppermost or newest being the last, are 1. Red sand-stone; 2. Amygdaloid; 3. Grey sand-stone; 4. Lime-stone; 5. Slate-clay; 6. Clay-stone; 7. Tuff; 8. Basaltic clink-stone; 9. Green-stone; 10. Clay-stone porphyry; 11. Compact felspar. The different veins that traverse the strata of the district of which this ingenious observer has given an account, are, calcareous spar, steatite, heavy spar, iron, cobalt, silver, copper, and lead. The first part of Mr. Mackenzie's communication contains a geographical delineation of this beautiful and interesting range of hills. *Beauties of Scotland*, vols. iii. and iv. A Tour in Scotland, by Thomas Pennant, three vols. 4to. London 1790.

OCHINUS, BERNARDIN, in *Biography*, a celebrated Italian Capuchin monk, who flourished in the sixteenth century, and became a convert to the Protestant faith, was born at Sienna in the year 1487. While very young he entered among the religious of the Franciscan order distinguished by the name of Cordeliers, but resuming the lay-habit, he applied himself to the study of physic, and acquired the esteem of cardinal Julio de Medici, who afterwards ascended the pontifical throne under the title of Clement VIII. He was now seized with compunction for having quitted the religious profession, and re-entered the order which he had abandoned, and to which he became, as well by his talents as his piety, a bright ornament. In 1534 he entered the reformed order of Capuchins which had been lately confirmed, and in this new connection he distinguished himself by his regularity, his au-

terities, and sanctity of demeanour. He contributed so much to extend and improve the order, that by some writers he has been deemed its founder. In 1538 he was elected vicar-general of the order, in a chapter which was held at Florence, and so well did he conduct himself, that he was, in 1541, elected a second time to that dignity, in a chapter that was held at Naples. He became eminent in the highest degree as a pulpit orator, and was attended by crowds, not only of the common people, but of the most illustrious prelates, princes, and men of rank. So great was his fame as a preacher, that he was invited to display his talents in the most celebrated cities of Italy; and he was chosen chaplain and father confessor to pope Paul III. About the year 1541 he became acquainted with John Valdes, a Spanish civilian, who had embraced the opinions of Luther, and by him Ochinus was converted to the same faith, and became satisfied that Popery was a system of delusion and tyranny over the consciences of men, and that evangelical Christianity was to be found only among the professors of the reformed communion. This important change in his opinions was soon made known, and he was summoned to the court of Rome to answer for himself. In his journey he met with Peter MARTYR, (see his article,) at Florence, who had likewise abandoned the Popish religion, and having consulted together, they agreed to retire to some country where they might be beyond the reach of the papal power. Accordingly Ochinus immediately set out, and arrived at Geneva in the year 1542; from Geneva he went to Augsberg, where he published some sermons. While in this place he married, and in 1547, on the invitation of Cramer, archbishop of Canterbury, he accompanied Peter Martyr to England, for the purpose of carrying on the great work of reformation in this country. Here they met with a very cordial reception at Lambeth, and laboured with great diligence and success in promoting the object of their mission. In the year 1549 John Poyntet, afterwards bishop of Winchester, published in English Ochinus's "Dialogue of the unjust usurped Primacy of the Bishop of Rome," which he had translated from the Latin. According to Wood, Ochinus was made a prebendary of Canterbury; and Neal says that he and Fagius were so far patronized, as to have pensions or canonries with a dispensation of residence; but upon the death of king Edward VI. Peter Martyr and Ochinus were obliged to quit England. They returned to the continent, and arrived at Straßburg in the year 1553. In 1555 Ochinus went to Basil, and accepted an invitation to become minister of an Italian church, which was formed about that time at Zurich. Here he continued to officiate till 1563, when, espousing some doctrines not agreeable to the theological system of the Helvetic doctors, he was obliged to resign his charge, and he retired to Basil, from which place he was also driven, at the age of 76, and compelled to seek a sanctuary in an inclement season of the year. He sought refuge, but without success, in Poland, an edict having been passed by king Sigismund, which banished from his realms all heretics who were foreigners. Some of his friends would gladly have detained him in Poland, but he had learnt so much of the doctrine of passive obedience, as to declare that it was the duty of subjects to obey their sovereign, and that he would set an example of obedience, and prefer death among the wild beasts of the woods, than counteract his orders. He accordingly set out for Moravia, but was seized with the plague at Pinczow, which carried off two sons and his daughter. Ochinus himself recovered so far as to be able to renew his journey, but he died in three weeks at Slawkaw, in 1564, about the age of seventy-seven. He was author of a vast number of works, written chiefly in Italian,

Italian, but they have been translated into various languages: the most known are "A Commentary on the Epistle to the Galatians," and six volumes of sermons.

OCHOCRATIA, from *οχλος*, *multitude*, and *κρτος*, *power, command*, a form of government wherein the populace has the whole power and administration in its own hand.

OCHNA, in *Botany*, an old Greek name, whose etymology is very uncertain, retained by Linnæus for the present genus, in preference to a barbarous one, *Jabotapita*, which had been bestowed, on what he supposed the same, by Plumier; (see *GOMPHIA*.) Whether Linnæus, in adopting *Ochna*, had any view in its derivation to the word *οχλειν*, *to suffocate*, on account of some of the germen being small, or, as it were, abortive, can only be matter of conjecture, since he has left us no clue to warrant such an assertion. Linn. Gen. 266. Fl. Zeylan. 93. Schreb. 354. app. 833. Willd. Sp. Pl. v. 2. 1158. Mart. Mill. Dict. v. 3. Ait. Hort. Kew. ed. 2. v. 3. 297. Juss. 282. Lamarck Illustr. t. 472. f. 1.—Class and order, *Polyandria Monogynia*. Nat. Ord. *Coadunate*, Linn. *Magnoliæ*, Juss.

Gen. Ch. Cal. Perianth inferior, of five, ovate, or oblong, spreading, permanent leaves, as large as the petals. Cor. Petals from five to twelve, oblong, deciduous. Stam. Filaments numerous, short, permanent; anthers linear, erect, deciduous. Pist. Germens superior, generally as many as there are petals; style awl-shaped, longer than the stamens, permanent; stigma perforated. Peric. Drupas several, elliptical, pulpy, placed in a circle. Seed. Nut solitary, the shape of the drupa, with one kernel.

Ess. Ch. Calyx five-leaved, inferior, permanent. Petals numerous, nearly equal. Drupas several. Nut solitary.

1. *O. squarrosa*. Yellow-flowered Ochna. Linn. Sp. Pl. 731. Roxb. Coromand. v. 1. 62. t. 89.—Stalks many-flowered. Petals eight. Native of the East Indies, and introduced at Kew, by sir Joseph Banks, in 1790, where it flowers in July and August.—This is a small tree, with alternate branches. Leaves rather crowded at the ends of the branches, alternate, on short stalks, oblong, acute, finely serrated, smooth, four or five inches long, and nearly half as broad, when young they are beautifully tinged with purple. Flowers in lateral, alternate clusters, large, yellow, inodorous. Bractæas small, deciduous. Drupas when ripe nearly black.

2. *O. parvifolia*. Small-leaved Ochna. Vahl. Symb. v. 1. 33. Willd. n. 2. (*Euonymus inermis foliis alternis ovatis ferrulatis*; Forsk. *Ægypt-Arab*. 204.)—Stalks single-flowered.—Native of Arabia Felix.—"The habit of this shrub greatly resembles that of the last species, but its leaves and inflorescence are considerably smaller.—Branches round, smooth, covered with an ash-coloured, dotted bark. Leaves alternate, on stalks, quite entire at the base, veined, shining, only half an inch long. Flower-stalks lateral, solitary, gradually thickening upwards, purple, longer than the leaf." Vahl.

OCHORIOS, in *Geography*, a bay on the N. coast of the island of Jamaica. N. lat. 18° 26'. W. long. 76° 56'.

OCHODONA, in *Zoology*. See *LEPUS Alpinus*.

OCHOTA, or **OKHOTA**, a river of Russia, which runs into the sea, at the town of Ochotsk.

OCHOTSK, or **OKOTSK**, a sea-port town, or rather station, of Russia, which gives name to a province that is part of the government of Irkutsk, and from which vessels sail to Kamtschatka. As the vicinity of this place produces little or no grass, provisions are brought hither from Yakutsk, both by land and water. Both modes of conveyance are difficult and tedious. The land carriage is by a

road that lies over mountains, morasses, and through thick woods of larch and beech trees, and as the distance is 919 versts, the journey with horses and rein-deer takes up nearly six weeks. The latter are furnished for this purpose by the Tungusians, who live in the neighbourhood of Ochotsk, near the sea to which it gives name. N. lat. 59° 28'. E. long. 142° 44'.

This town is longer than it is wide, and extends from E. to W. nearly in a line. On the S. side is the sea, at 100 yards from the houses, with a beach of flints between. On the N. the walls are washed by the river Okhota, whose mouth is to the eastward, or at the extremity of a neck of land on which the town is built, and which widens towards the W. The buildings make but an indifferent appearance. Behind, close to the river, is a street, inhabited by merchants, whose shops are regularly disposed on each side. The port scarcely deserves the name. M. de Lefseps, when he visited this place, counted seven or eight small vessels or galiots, some belonging to the crown, and others to merchants trading in furs to America. As Okotsk was the seat of government, and the principal mart for Russian commerce, this inquisitive traveller endeavoured to acquaint himself with the causes which first gave rise to the enterprises of the Russian colonies in that country, and which served to fix them in it. He found, that by the conquest of the eastern part of Siberia, the Russians got possession of the rich mines with which they enriched themselves, and which were held in little estimation by the inhabitants. To the extraction of iron, the conquerors added that of silver, of gold, and of other precious metals. The discovery of these sources of wealth inflamed the courage of the adventurers, till the desire of extending their dominions carried them to Irkutsk. At their first incursions into the neighbouring countries, they perceived with regret that the same advantages were not to be expected. However, contemplating the clothing of the people, they were furnished with a new incentive to avarice, and determined to rob them of it; and on advancing further to the east of Asia, it was perceived that the furs became more beautiful; and hence the Russians very easily persuaded themselves, that it would conduce to their interest and glory to subject every part of this vast territory to their laws. Accordingly they made themselves masters of the country as far as Okotsk, and pushed their conquests in the north to the river Anadyr. Forts were constructed, and towns built. The Russian merchants sent their factors to Okotsk, which, from the advantages of its situation, became the metropolis. The navigation, however, was little more than cruising, and the vessels from Kamtschatka were chiefly galiots. The cargoes they brought back, that is, the precious stones taken from the inhabitants, either in barter or as imposts, were sent to the centre of the empire, and sold under the direction of government, but without much profit, which was consumed by the immense duties that were imposed. In the mean time Okotsk flourished, and the number of vessels that entered its port daily increased as fresh connections opened fresh objects of traffick. The following is the mode of traffick adopted at Okotsk, whence several vessels every year sail for America. When a merchant wishes to make this voyage, he obtains permission of the governor. The cargo is divided into shares, which are bought by those who choose to become purchasers. The price of the shares defrays the expence of fitting and of the different articles of merchandize, which consist of stuffs, iron utensils, glass trinkets, handkerchiefs, brandy, tobacco, and other commodities esteemed by savages. The officers and sailors have a part of the cargo instead of wages. Upon their return from a voyage, which lasts three, four, or six years, the

owners

owners pay duties to the treasury, and the remainder is valued and equally divided among the owners. A part of the merchandize is then sent to Okotsk, and part to Yakutsk, thence to Irkutsk, and last of all to Kiachta, where the Chinese become the purchasers. Perouse's Voyage, vol. ii. appendix.

OCHOTSK, or **OKHOTSK**, *Mountains*, a great chain, known under the name of Stanovoi-Krebet, which borders upon the Nertschinskoi, or upon the Yablonoi-Krebet, near the region of the sources of the Aldan and Oldekou, runs thence on one side northward on the Lena down to Yakutsk, and on the other side westward to the Oudinskoi gulf of the Okhotskoi sea, which swarms with islands; proceeds round this to the Upper Okhotsk, and strikes out several branches in the parts between the Lena and the Indighirka, between this and the Kolyma, and between this and the Anadyr, where a part of the mountain runs out upon the Tshuskoi promontory, while the other continues its course into the peninsula of Kamtschatka. All these extensive mountains are almost entirely unknown. From the district of Okhotsk have been brought jasper, porphyry, and beautiful chalcodones and carneoles, sulphur-pyrites, native alum, agaricus aluminaris, mountain crystal, coals, &c.; and here are likewise warm springs. The mountain is, for the most part, not very abundant in woods. Its principal rivers on the Russian or northern side are the Amga, the Aldan, the Uda, the Maia, the Yana, the Indighirka, the Kolyma, and the Anadyr.

OCHOTSKOE, or **OKHOTSKOI**, *Sea*, a large bay of the North Pacific ocean, on the E. coast of the Russian dominions, so called from the sea-port of Ochotsk, or Okhotsk. N. lat. 54° to 59° . E. long. 137° to 147° .

OCHRA, or *Gallinula* **OCHRA**, in *Ornithology*, the name of a species of moor-hen. It is all over of a dusky and obscure yellowish-green, and is browner on the breast and belly than on the back, yet with the same yellowish-green predominant; the head, neck, breast, and wings, have several white spots; and the face is in part white; the beak is part black, and part red; and the legs are of a yellowish colour. See **SCOLOPAX**.

OCHRE, in the *Arts*, a yellow powder of an earthy appearance. It in general consists of some earth, as lime or clay, combined with a sub-salt or oxyd of iron.

The oxyd of iron in this substance is mostly combined with either the sulphuric or carbonic acids, and in general is derived from the decomposition of super-sulphuret of iron. By exposure to the air and moisture, the latter substance is converted into sulphuret of iron. This salt, by exposure to the oxygen of the atmosphere, soon resolves itself into two salts, namely, the super-oxyfulphat of iron and the sub-oxyfulphat. The latter, being insoluble, is precipitated, forming a yellow deposit, frequently seen in such chalybeate springs as result from the decomposition of pyrites. This yellow precipitate penetrates the earth and tinges it with the same colour, but more dilute. The mixture constitutes a species of ochre. When the soil, with which the subsalt combines, consists of certain proportions of lime and alumine, free from stones or other heterogeneous matter, the ochre is more valuable.

Those chalybeate waters which contain the super-carbonat of iron, and which are frequently found, are capable of forming ochre, but of a different quality from the last. The carbonat held in the water is super-carbonat with the black oxyd of iron. By exposure to the air an atom of carbonic acid escapes, the oxyd takes another atom of oxygen from the atmosphere, and is precipitated with the other atom of carbonic acid in the form of oxycarbonat, which is in the

form of an insoluble powder of a yellow colour. This ochre is of a deeper yellow than that derived from the sub-oxyfulphat. Its colour may be converted into a beautiful brown by applying a heat to it, sufficient to expel its carbonic acid, leaving behind the second oxyd of iron. The heat of boiling water is sufficient for this purpose. This ochre, so changed, has most of the properties of umber. The sub-sulphat does not so readily assume the brown colour, on account of the greater heat required to expel its acid.

Artificial ochres may be prepared of equal, and perhaps of superior quality to those in nature. The sulphat of iron in the manufacture of this article, previous to its crystallization, is partly in the state of oxyfulphat, and becomes wholly so by long exposure to the air. As it remains in this situation it will gradually resolve itself into the super-oxyfulphat and the sub-oxyfulphat. The latter falls to the bottom of the vessel in the form of a yellow powder, which, when washed and dried, constitutes a beautiful colour.

When carbonat of potash is added to the super-oxyfulphat, the carbonat of iron will be formed, which will precipitate in the state of a yellow powder. This powder, when washed, and the water evaporated, constitutes an ochre which is a little deeper in colour than the last. The heat of boiling water drives off the carbonic acid, leaving the oxyd of an agreeable brown colour.

OCHRE, in *Agriculture*, a sort of oxyd or calx of iron, which is frequently met with in some sorts of soil. The author of *Phytologia* states, that red ochre may in some cases be favourable to vegetation, though it has generally been supposed prejudicial to it.

It is, however, stated by Mr. Nicol, that the most untoward of all soils, for the produce of timber in high perfection, is an irony till of little depth, lying on a retentive subsoil, which upholds a poisonous ochry water, and which stagnates on the surface, or remains latent in the body of the soil, which is the pasture of the roots, contracting the mouths of the fibres, contaminating the juices, and finally operating to the destruction of the tree, by poisoning it, and hastening its dissolution.

It is well known that ochres also form the basis of various kinds of pigments, paints, and other similar matters.

OCHREA, in *Botany*, Willd. Princip. of Bot. 50, a name given by Rottböll, to the peculiar kind of bractea, which enfolds the flower-stalks in *Cyperus*, and some similar plants, in the form of a close membranous sheath. There seems little occasion for this term, nor is it advisable to give into the too general practice of botanists, who, in writing upon any one particular tribe or natural order, invent new terms without necessity. The terms *bractea*, *involucrum*, *receptacle*, &c. are universal, and we should be involved in great confusion if we had a separate name for each in every different natural order. The cryptogamic authors are most prone to this inconvenient custom, because they fancy the plants with which they are conversant must, in every thing, differ from others.

OCHROITE of Klaproth, in *Mineralogy*, is the *Cerium* of the two Swedish chemists, Hisinger and Berzelius, and the *reddisb Tungsten* of Scheele; which see.

OCHROMA, in *Botany*, so named by Professor Swartz, from $\omega\chi\rho\omicron\varsigma$, *pale*, in allusion to the pallid hue of its flowers, leaves, and wool of its seeds. Swartz Prodr. 97. Ind. Occ. v. 2. 1143. Schreb. 454. Willd. Sp. Pl. v. 3. 605. Mart. Mill. Dict. v. 3.—Class and order, *Monadelphia Pentandria*. Nat. Ord. *Columniferae*, Linn. *Malvaceae*, Juss.

Gen. Ch. *Cal.* Perianth double, inferior; outer of three, lanceolate, falling leaves; inner of one leaf, funnel-shaped, five-cleft. *Cor.* Petals five, wedge-shaped, coriaceous.

Stam.

Stam. Filament one, cylindrical; anthers five, large, linear, connate, marked on the outside with zigzag furrows. *Pist.* Germen superior, oblong; style thread-shaped, inclosed by the filament; stigmas five, awl-shaped, twisted. *Peric.* Capsule coriaceous, somewhat cylindrical, angular, with five furrows, five cells, and five valves; valves internally woolly, revolute at the margin; partitions kidney-shaped. *Seeds* numerous, oblong.

Eff. Ch. Calyx double; outer of three leaves. Anthers combined, irregularly furrowed. Capsule five-celled, and many-seeded.

1. *O. Lagopus*. Down-tree. Swartz Prodr. 98. Act. Stockholm. for 1792. 148. t. 6. (Gossipium; Plum. MSS. v. 4. t. 8. Gossipium, seu Xylon arboreum; Pluk. Alm. t. 189. f. 2. Bombax pyramidale; Cavan. Diss. 5. t. 153. Hibiscus arboreus, trichotomus; foliis amplissimis cordato-angulatis; seminibus lanâ obvolutis; Brown. Jam. 286.)—Found in waste places on the hills of Jamaica and Hispaniola, where its beautiful flowers expand in February, and its capsules ripen in May. We think it flowered in great perfection, about two years since, in the stove of A. B. Lambert Esq. V.P.L.S., at Boyton in Wiltshire. The trunk of this tree is from twenty to forty feet in height, about twelve inches in diameter, erect, with a pale, ash-coloured, brittle bark. Branches terminal, twice or thrice forked, spreading, smooth. Leaves more than a foot in length, terminal, nearly vertical, scattered, heart-shaped or roundish, angulated, smooth and dark-green above, pale underneath, with rufescent hairs. Stalks horizontal, as long again as the leaves, round, rusty-coloured. Flower-stalks terminal, solitary, round, smooth, single-flowered. Flowers erect, three or four inches long, pale red or yellowish, somewhat succulent and fleshy. Seeds inclosed in a fine rusty down.

The growth of this tree is said to be very rapid, and its wood so light as to become a substitute for cork. The woolliness of its seeds is particularly fine and silky, and is much used in the manufacture of fine hats.

OCHROPUS GALLINULA, in *Ornithology*, a name by which many authors have called a bird more usually known by the name of tringa. See *TRINGA Ochropus*.

OCHROPUS, or *Gallinula Ochropus*, the yellow-legged moor-hen, a species of the gallinula, or moor-hen. It is of the size of the common kind; its beak, as well as its legs, is yellow, or of a sulphur colour; its back is of a reddish-brown, the tips of its wings of a very fine red; it has white variegations on its head, and in the middle of its wings, and on its belly; the longest feathers of its wings are black; and there are also spots of black on the back in several places; the edges of its eye-brows are of a deep saffron-colour; and it has, beside all these colours, a great deal of grey in the wings; it has no hinder toe. It builds in thickets, in watery places, among rushes and high grass. See *FULICA Flavipes*.

OCHROSIA, in *Botany*, so called by Jussieu, from *ωχρος*, pale. Juss. 145. A shrub found by Commerçon in the isle of Bourbon, where it is known by the name of Bois jaune, or Yellow wood. The leaves are three or four in a whorl. Flowers in axillary or terminal forked corymbs. Calyx minute, five-toothed. Corolla tubular, funnel-shaped; its limb in five deep spreading segments. Style one; stigma tumid. Follicles divaricated, drupaceous, ovate, each with a bilocular nut, with two or three kernels in each cell. Seeds unequal, flat, scarcely membranous at the summit.

Jussieu refers this genus to his *Apocineæ*, before *Tabernaemontana*, to which and to *Rauwolfia* he esteems it nearly allied.

OCHROXYLUM, a genus known only from Schreber, who had originally called it *Curtisia*, in commemoration of the well-known botanist of that name, but upon finding the same honour had previously been conferred on Mr. Curtis, in the *Hortus Kewensis*, Schreber changed the name to *Ochroxylum*, derived we presume from *ωχρον* ξυλον, pale wood. Schreb. app. 826. Mart. Mill. Dict. v. 3.—Class and order, *Pentandria Trigynia*. Nat. Ord. *Dumoseæ*, Linn. *Rhamni*, Juss.

Gen. Ch. Cal. Perianth very small, permanent, divided into five, ovate, acute, spreading segments. Cor. Petals five, ovate, reflexed, rather obtuse, excavated below the top, thickish, with a thinner margin. Nectary an annular, somewhat three-lobed, fleshy gland. Stam. Filaments five, awl-shaped, flattish in the lower part, erect, a little longer than the corolla; anthers roundish, incumbent. Pist. Germens three, placed on the nectary, boat-shaped externally; styles short; stigmas simple. Peric. Capsules? three, approximating, nearly globular, inwardly compressed, infident on the lobes of the enlarged nectary, of one cell, bursting inwardly? Seeds two, convex on one side, compressed and angular on the other.

Eff. Ch. Calyx five-cleft. Petals five. Nectary an annular, three-lobed gland. Capsules? three, approximating, one-celled, two-seeded.

We are not aware that Schreber ever published an account of the species of *Ochroxylum*, neither is any thing known concerning it but what we find in his Genera above.

OCHRUS. See *PISUM*.

OCHSENBERG, in *Geography*, a town of Wurtemberg; 12 miles W. of Heilbronn.

OCHSENFURT, a town of the duchy of Wurzburg; 8 miles S.S.E. of Wurzburg. N. lat. 49° 4'. E. long. 20° 6'.

OCHSENHAUSEN, a town of Germany, near which is a princely abbey, founded as a priory in the year 1190, and raised to an abbey in 1391; 14 miles S. of Ulm.

OCHSENWERDER, an island in the Elbe, about eight miles long, and four wide, on which are several villages; 4 miles S.E. of Hamburg.

OCHTEE, a river which runs into the Weser, about eight miles below Bremen.

OCHTROP, a town of Germany, in the bishopric of Munster; 21 miles N.N.W. of Munster.

OCIER, a town of the island of Sardinia; 28 miles E.S.E. of Sassari.

OCIMUM, in *Botany*, Sweet Basil, *ωκίμον* of the Greeks, has been supposed to owe its name to the strong scent, for which several species of this genus are remarkable; but that scent is of too sweet and aromatic a quality, and too famous on that account, to accord with the true meaning of the verb *οζω*. Some derive the word from *ωκεως*, quickly, and suppose it alludes to the rapid germination or growth of the plant; a property which others rather attribute to a kind of fodder, termed *Ocimum*, distinct from *Ocimum*. Hence it appears that nothing certain is known on the subject. Linn. Gen. 300. Schreb. 396. Willd. Sp. Pl. v. 3. 158. Mart. Mill. Dict. v. 3. Ait. Hort. Kew. ed. 2. v. 3. 422. Juss. 116. Lamarck Illustr. t. 514.—Class and order, *Didynamia Gymnospermia*. Nat. Ord. *Verticillatæ*, Linn. *Labiata*, Juss.

Gen. Ch. Cal. Perianth inferior, of one leaf, two-lipped, very short, permanent; upper lip flat, roundish, broadest, ascending; lower in four acute close segments. Cor. of one petal, ringent, reversed; tube very short, swelling upwards; one lip, which is turned uppermost, broadest, divided half way down into four obtuse equal segments; the

other, directed downwards, narrower, longer, undivided, serrated. *Stam.* Filaments four, declining, two of them rather the longest, and two furnished with each a lateral reflexed process at the base; anthers crescent-shaped. *Pist.* Germen in four deep lobes; style thread-shaped, the length and position of the stamens; stigma cloven. *Peric.* none, except the closed calyx. *Seeds* four, ovate.

Eff. Ch. Upper lip of the calyx orbicular; lower four-cleft. Corolla reversed; one lip four-cleft; the other undivided. Outmost stamens furnished with a process at their base.

This genus consists of a number of generally herbaceous, and annual or biennial, plants, with opposite, simple, stalked leaves, and racemose whorled flowers, whose corolla is pale or purplish, sometimes spotted. They are for the most part of East Indian origin, and valued for their peculiarly fragrant smell, which in some instances resembles that of the nutmeg. Whether for this reason, or for any other, several of the species are held in superstitious veneration by the Hindoos, and are used in their religious ceremonies. Twenty-one species are enumerated in the 14th edition of *Syst. Veg.*, but in these are included the genus *PLECTRANTHUS* of L'Heritier. (See that article.) Willdenow has twenty-seven, of which thirteen are mentioned in *Hort. Kew.*, as cultivated in the English gardens; where they generally require to be kept in the stove or green-house, or raised on a hot-bed and afterwards planted out in the borders, under the protection of a wall. They have little but their scent to recommend them, nor do they all possess this claim to notice. We suspect that several nondescript species are still latent, amongst the unexplored weeds of India, and that some of those already described are not very correctly determined. We regret our inability to clear up these doubts. Seeds of some of the more celebrated kinds, sent by our learned friend Dr. Buchanan for the purpose of investigation, unfortunately failed to vegetate. The species most in estimation are known at Calcutta by the general appellation of Toolsey. The following may serve as examples.

O. gratissimum. Shrubby Basil. Linn. Sp. Pl. 832. Willd. n. 5. Ait. n. 3. Jacq. Ic. Rar. t. 495. (*O. zeylanicum perenne odoratissimum latifolium*; Burm. Zeyl. 174. t. 80. f. 1.)—Stem shrubby. Leaves ovate. Clusters cylindrical.—Native of Ceylon and other parts of the East Indies. Miller cultivated it in 1752. This is one of the few species whose stem is shrubby, forming a bush two or three feet high. The leaves are stalked, truly ovate, though tapering at the base, and copiously serrated, two or three inches long, slightly downy, especially on the ribs and veins; their smell, when gently touched, like cloves or nutmegs. Flowers very numerous, small, downy, reddish, in long copious terminal, spreading, straight clusters.

O. Basilicum. Common Sweet Basil. Linn. Sp. Pl. 833. Willd. n. 9. Ait. n. 5. (Oeimum; Camer. Epit. 308. *O. magnum*; Ger. em. 673.)—Leaves ovate, smooth. Calyx fringed.—Native of India and Persia. One of the exotics first known in our gardens. It may be treated as a hardy annual, but is best raised on a hot-bed. The leaves are peculiarly smooth, soft, and cool to the touch, and if not too much bruised, exhale a very delightful smell. They vary in colour, being often spotted with purple, and are also occasionally curled, cut, or blistered. The very hairy calyx is remarkable.

O. sanctum. Purple-stalked, or Sacred Basil. Linn. Mant. 85. Willd. n. 12. Ait. n. 7. (Kattu-tumba; Rheede Hort. Malab. v. 10. 183. t. 92.)—Leaves rather oblong, blunt, serrated, wavy. Stem hairy. Bractæas

heart-shaped.—Native of the East Indies. Said to have been introduced into this country by the late Duke of Northumberland in 1758. It is annual, and kept in the stove. Linnæus had an East Indian specimen sent him, as the "Sacred herb of the Bramins;" as well as seeds, which he raised at Upsal. He justly remarked that the herb has scarcely any smell. Dr. Buchanan thinks there is some error in the history of this species, the Basil, which is really held sacred, having a powerful odour.

O. americanum appears likewise to be involved in some obscurity; that of Linn. Sp. Pl. 833, said to come from America, being a much smaller and narrower-leaved plant than Jacquin's, Hort. Vind. v. 3. 45. t. 86, which last was marked by Linnæus *purpurascens*, but he does not appear to have described it under that name. He had a Jamaica specimen from Browne.

OCIMUM, in *Gardening*, comprehends plants of the tender herbaceous aromatic annual kind, of which the species cultivated are; the common sweet basil (*O. basilicum*); the bush basil (*O. minimum*); and the slender-spiked basil (*O. tenuiflorum*).

The first has varieties with purple fringe-leaves; with green fringe-leaves; green with fluted leaves; and the large-leaved basil.

But the middle-sized variety, or that which is used in the kitchen, especially in French cookery, rises about ten inches high, sending out opposite, four-cornered branches from the very bottom: the leaves are ovate-lanceolate, ending in acute points, indented on their edges. The whole plant is hairy, and has a strong scent of cloves, which to some is very agreeable.

The chief subvarieties of which are; the common basil, with very dark green leaves, and violet-coloured flowers; the curled-leaved basil, with short spikes of flowers; the narrow-leaved basil, smelling like fennel; the middle basil, with a scent of citron; the basil with fluted leaves; and basil with leaves of three colours.

In the second sort there are also varieties with black purple leaves, and with variable leaves.

Method of Culture.—These are all capable of being increased by sowing the fresh seeds in the latter end of March, upon a moderate hot-bed, covered to the depth of five or six inches with good light mould, putting them in a quarter of an inch deep, fresh air being given daily, and slight waterings occasionally. When the plants have attained a few inches in growth, they should be pricked out upon another hot-bed four inches apart, or set in pots of a small size, plunging them in the hot-bed, water and occasional shade being given till fresh rooted, with fresh air and water in small proportions afterwards. In the latter part of the spring or beginning of summer, they should be begun to be hardened, and in the hot weather set out in the open air where wanted. Some may be set out in the borders in the open ground, a slight watering being given at the time.

But in order to obtain good seeds, a few of the potted plants should be placed in a good green-house, or glass case, in the latter end of the summer, fresh air being freely admitted.

It may be observed that the first sort and varieties are often used as culinary herbs, and all the sorts may be set out among other potted plants, in rooms and windows, especially the bush sort, as well as in the borders and clumps for ornament and variety.

OCIVAS, in *Geography*, a town of Brazil, in the government of Maranhao.

OCKENHEIM, or *HOKENHEIM*, in *Biography*, the oldest and most venerable composer in parts on the continent,

ment, of whose works we have been able to find any remains.

M. le Duchat, in his notes upon Rabelais, says he was a native of Hainault, and treasurer of St. Martin de Tours; but we believe this assertion was hazarded more with the patriotic view of making Okenheim as much a Frenchman as possible, than from proof or conviction; for he was always spoken of as a Netherlander by his contemporaries, Tinctor, Franchinus, and even in the "Deploration," or Dirge, written upon his death, which his scholar, Jusquin, set to music in five parts, as well as in the following, which was set by Guillaume Crespel:

"Agricola, Verbonnet, Prioris,
Jusquin des Pres, Gaspard, Brunel, Compere,
Ne parlez plus de joyeux chants, ne ris,
Mais composez un ne recorderis,
Pour lamenter nostre maistre et bon pere."

There is still another dirge, in Latin, on the death of Okenheim, set to music by Lupi, a Netherlander, and composer of eminence in the time of the emperor Charles V. Many of whose Latin motets, and French songs, in parts, are preserved in the museum collections, as are those of Crespel, the composer of the French "Deploration," just cited.

Little more is recorded concerning the life of Okenheim, than that he was a Netherlander, who flourished in the fifteenth century, produced many learned and elaborate compositions for the church, and had many scholars, by whom he seems to have been much beloved and respected. It is, indeed, often mentioned to his honour, that he was the master of Jusquin: but he seems to have been as fortunate in a disciple, as Jusquin in a master: as no great professor is sure of making great scholars in any art, unless he have genius and diligence to direct; and it is only from such fortunate and rare concurrences that the narrow limits of mediocrity are surpassed, or the wild effusions of youthful ardour restrained.

None of the musical writers of the sixteenth century forget to tell us that Okenheim composed a motet in thirty-six parts: of what these parts consisted, or how they were disposed, is not related by Ornithoparcus, Glareanus, Zarlino, or any one who mentions the circumstance, which all seem to have received from tradition. But of our countryman, Bird, a song is still preserved in forty parts; yet though we have seen this effort of science and labour, the effects must still be left to imagination, for where shall we find forty voices, assembled together, that are able to perform it.

We may, however, deduct from the reputation of Okenheim all the increase it received from the story of his Polyphonic composition, and there will still remain sufficient cause for the respect and wonder of contrapuntists, in the fragments only of his works which have been preserved in the "Dodecachordon" of Glareanus. This writer tells us, that he was fond of the *Katholiken* in the cantus; that is, of composing a melody which may be sung in various modes, or keys, at the pleasure of the performer, observing only the ratio or relation of consonant notes in the harmony.

Okenheim likewise composed a mass for three and four voices, *ad omnem tonum*, which, as the words imply, might be sung in any of the three species of diatessaron, each part beginning at *ut*, *re*, *mi*, or in *c*, *f*, *g*, major, and *d*, *e*, *a*, minor, on which account no indicial clef is marked; as the performer, at setting off, has his choice of any of the modes, or ecclesiastical keys. Indeed all the fragments

from Okenheim are inserted in Glareanus, without bars, clefs, or accidental flats and sharps.

It is not certain when Okenheim died, but he is generally mentioned as a composer of the fifteenth century, and we have met with no proof of his existing in the next.

OCKER, in *Geography*, a river which rises by several springs in the Hartz forest, about 8 miles S.E. from Goflar, and after passing by Wolfenbuttle, Brunswick, &c. runs into the Aller, 5 miles W. of Gifhorn.

OCKLEY, SIMON, in *Biography*, a distinguished oriental scholar, was born at Exeter in 1678. He was entered of Queen's college, Cambridge, in 1696, where he applied himself very assiduously to the several branches of literature, and especially to the oriental languages. Having taken orders, he was presented to the living of Swavesey, in Cambridgeshire, and in 1711 was chosen professor of Arabic in that university. He married while young, and the expences of a growing family involved him in debt, for which he was thrown into confinement among the debtors in Cambridge castle, whence he dates one of his works in the year 1717. It is not known by what means he obtained his liberty, but he did not live long to enjoy it, dying in 1720. He displayed his zeal for promoting the study of Eastern literature, in a publication entitled "Introductio ad Linguas Orientales," dedicated to the bishop of Ely, and addressed to academical youth, with an exhortation to pursue a branch of learning, without which, he says, no one ever became a great divine. The most considerable work of this learned author was his "History of the Saracens," from 633 to 705, in two volumes octavo; the first was published in 1708, and the second in 1718, while he was in prison. This is a valuable work, and contains much curious and entertaining information, respecting the religion, manners and customs of the Saracens, of which a great part was new at the time when he wrote. In 1707 he published a translation from the Italian of "The History of the Present Jews throughout the World by Leo Modena, a Venetian Rabbi;" and in the following year he gave a translation from a curious work entitled "The Improvement of Human Reason, exhibited in the Life of Hai Ebn Yokdhan, written by Abu Jaafar Ebn Tophail." Biog. Brit.

OCLISSER, in *Geography*, a town of Hindoostan, in Guzerat, on the S. side of the Nerbuddah, opposite to Baroach.

OCOCOLIN, in *Ornithology*. See TETRAO *Newius*.

OCOL, in *Geography*, a town of Thibet; 80 miles W.N.W. of Cha-tcheou.

OCONA, a town and port of Peru, near the coast of the Pacific ocean, in the diocese of Arequipa; 96 miles W.N.W. of Arequipa. S. lat. 16°.

OCONEE, a river of America, which is the N. main branch of Alatomaha river, in the state of Georgia, in many places 250 yards wide; its banks abound with oak, ash, mulberry, hickory, black walnut, elm, sassafras, &c.—Alto, a town on the E. bank of the fore-mentioned river; 62 miles W. by N. from Augusta.

OCOPA, a town of Peru, in the jurisdiction of Atun Xauxa.

OCOQUAN, a river of America, in Virginia, which, after a short course, discharges itself into Patowmack river, five miles below Colchester, N. lat. 39° 39'. W. long. 77° 18'.

OCORONI, a town of New Mexico, in the province of Cinaloa; 12 miles N. of Cinaloa.

OCOTEA, in *Botany*, a name of Aublet's, of whose origin or meaning we have no account. It can scarcely have been.

been manufactured out of *Ajou-hou-ba*, the Caribean appellation of the fine tree to which it belongs. See POROSTEMA.

OCOTZINITZAN, in *Ornithology*. See ORIOLUS *Annulatus*.

OCOZINGO, in *Geography*, a town of Mexico, in the province of Chiapa; 40 miles E. of Chiapa dos Espagnols.

OCREA, among the *Ancients*, a kind of military shoe, or short boot, which was made of white tin, and ornamented with gold or silver, about the ankles. Its use was very ancient; the Greeks were so well provided with them in Homer's time, that he thence gives them the appellation of *ἐκνημιδες Ἀχαιοί*. Among the Romans, none were allowed to wear the *ocrea*, but the two upper classes of the people, or such whose estate exceeded 7500 drachmas.

OCRECOCK INLET, in *Geography*, a navigable inlet, though dangerous without a pilot, on account of its bars and shoals of sand, on the coast of North Carolina, leading into Pamlico sound, and out of it into Albemarle sound, through which all vessels must pass that are bound to Edenton, Washington, Bath, or Newbern. N. lat. $35^{\circ} 10'$.

OCRIDA. See AKRIDA.

OCRINUM, in *Ancient Geography*, a promontory of the isle of Albion, which was undoubtedly the Lizard point in Cornwall, probably called Ocrinum, from Och Rhen, a high promontory; and as the Britons kept possession of Cornwall so long, we need not be surprised that the present name of that promontory, the Lizard, is also of British derivation, from Lis-ard, a lofty projection.

OCROPHUS, in *Ornithology*. See TRINGA *Ochropus*.

OCRZKA, in *Geography*, a town of Poland, in the palatinate of Lublin; 26 miles N.W. of Lublin.

OCTABIS, in *Law*. See OCTAVE.

OCTACHORD, an instrument or system of music, composed of eight sounds, or seven degrees. The *octochord*, or lyre of Pythagoras, comprehended the eight sounds expressed by these letters, E, F, G, a, b, c, d, e: that is to say, two disjunct tetrachords.

OCTAETERIDES, formed from *οκταετηρίς*, composed of *οκτώ*, eight, and *ετος*, year, in *Chronology*, &c. the space or duration of eight years.

OCTAETERIS, *οκταετηρίς*, in *Antiquity*, a cycle, or term of eight years, at the end of which three entire lunar months were added. This cycle was in use till Meton, the Athenian, reformed the calendar, by finding out the golden number, or cycle of nineteen years. See CALENDAR and CYCLE.

OCTAETIS, in *Natural History*, a name given by Linnaeus, and many other authors, to a kind of star-fish of the *astrophyte* class, the rays of which are eight in number, where they first part from the body, but soon divide into many more.

OCTAGON. See OCTOGON.

OCTAHEDRON, or OCTAEDRON, in *Geometry*, one of the five regular bodies; consisting of eight equal and equilateral triangles.

The octahedron may be conceived as consisting of two quadrilateral pyramids put together at their bases.

Its solidity, therefore, is had, by multiplying the quadrangular base of either by one-third of the perpendicular height of one of them, and then doubling the product. The square of the side of an octahedron is in a subduple ratio of the square of the diameter of the circumscribing sphere. See REGULAR Body.

OCTANDRIA, in *Botany*, the eighth class in the Linnaean artificial system, and so named from the flowers which belong to it having eight stamens, in the same flower with

the pistil or pistils. The orders are four. 1. *Monogynia*, a very various and rich one, containing *Epilobium*, *Fuchsia*, *Erica*, *Vaccinium*, *Daphne*, and several other interesting plants. 2. *Digynia*, a very small order; see MOEHRINGIA. 3. *Trigynia*, chiefly remarkable for *Polygonum*, which however is not constant in the number of either stamens or styles. 4. *Tetragynia*, in which we find two curious British plants, the *Paris* and *Adoxa*.

OCTANT, or OCTILE, in *Astronomy*, an aspect or position of two planets, &c. wherein their places are distant by an eighth part of a circle, or 45° degrees from one another. See ASPECT.

OCTAPLA, formed from *οκτώ*, eight, q. d. *something with eight rows or columns*, a term in the sacred learning, used for a kind of ancient Polyglot bible, consisting of eight columns.

In the first column was the Hebrew text, in Hebrew characters; in the second, the same text in Greek characters; in the third, the Greek version of Aquila; in the fourth, that of Symmachus; in the fifth, the Septuagint; in the sixth, that of Theodotion; in the seventh, that called the *ffth*; the last was that called the *sixth*.

Origen was the author of the octapla, as well as of the tetrapla and hexapla.

OCTARARO CREEK, in *Geography*, a river of America, in Pennsylvania, which runs into the Susquehanna, N. lat. $39^{\circ} 40'$. W. long. $76^{\circ} 12'$.

OCTATEUCH, in the *Sacred Literature*, is used for the eight first books of the Old Testament, viz. Genesis, Exodus, Leviticus, Numbers, Deuteronomy, Joshua, Judges, and Ruth. Procopius of Gaza has ten commentaries on the Octateuch.

OCTAVE, the first and most perfect of concords in *Music*, in the order of their being generated by the harmonies of a single string; after the unison, it is that among all the sounds of which the ratio is most simple. The unison is in the ratio of equality, the coincidence of the pulsations happening together; that is, as 1 to 1. The octave is in the double ratio, that is, as 1 to 2. The harmonies of the two sounds reciprocally agree without exception, which does not happen in any other interval. In short, these two sounds (unison and octave) have such an affinity and resemblance, that they are often confounded in the melody, and in the harmony even one is indifferently taken for the other. When a child or a woman seems to be singing in unison with a man, they are constantly singing in octaves. This interval is called octave, or eighth, because in ascending diatonically there are seven degrees and eight different sounds. The following are the properties which so singularly distinguish the octave from all other intervals.

I. The octave includes within its limits all the primitive and original sounds; so that after having established a system or series of sounds in the extent of the octave, if we continue the progression, it must be done in a second octave by a similar series, and of a second and third or more octaves, where no sound will occur, which is not a recurrence of some one of the first series; and such a series is called the scale of music in the first octave, and replicates or recurrences in all the rest. (See SCALE and REPLICATE.) It is by virtue of this property of the octave, that it has been called *diapason* by the Greeks. See DIAPASON.

II. The octave further embraces all the consonances and all their differences, that is, all the simple concords and discords, and, consequently, all harmony. If we establish all the consonances upon the same fundamental sound, we shall have the following table:

120	100	96	90	80	75	72	60
120	120	120	120	120	120	120	120

which amounts to this :

$$1. \frac{5}{4} \frac{4}{3} \frac{3}{2} \frac{2}{1} \frac{1}{2} \frac{3}{4} \frac{2}{3} \frac{1}{4}$$

where all the concords are found in the following order : the third minor, the third major, the fourth, the fifth, the sixth minor, the sixth major, and lastly, the octave.

By this table it is manifest, that the simple concords are all contained between the octave and unison. They may even be heard all at once in the compass of an octave without any mixture of discords. Strike at the same time these four sounds, C E G c, in mounting from the lowest found to its octave, and they will form all the concords, except the major sixth, which is compounded ; and will form no other interval. Take any two of these sounds you please, and the interval will be always consonant. It is from this union of all the concords, that the chord which they produce is called the *common* or *perfect chord*.

The octave giving all the concords, consequently gives all the shades or differences, and by that means all the simple intervals of our musical system ; which are but deviations. The difference of the third major and the third minor gives the minor semitone ; the difference of the third major and the fourth, the major semitone ; the difference of the fourth and fifth gives the tone major ; and the difference of the fifth and sixth major gives the minor tone. Now the semitone minor and the semitone major, the tone minor and the tone major, are the only elements of all the intervals of music.

III. Every consonant found with one of the terms of the octave, is consonant also with the other ; consequently, every dissonant found with one is dissonant with the other.

IV. Finally, the octave has still this property, the most singular of all, that it may be doubled, tripled, and multiplied at pleasure, without changing its nature, and without ceasing to be a perfect concord.

This multiplication of the octave, as well as its division, is however bounded with respect to the powers of our organ of hearing ; and an interval of eight octaves exceeds our appreciation. (See COMPASS.) The octaves even lose something of their sweetness, by being multiplied ; and when a certain measure is passed, all the intervals become less easy for the ear to seize ; a double octave even becomes less agreeable than a single ; a triple than a double : in short, at the fifth octave, the extreme distance of the sounds robs consonance of almost all its charms. It is from the octave that we draw the order of all intervals by harmonic divisions and subdivisions. Divide the octave harmonically 3 6 by the number 4, and you will have on one side the fourth 3 4, and on the other the fifth 4 6. Divide in the same manner the fifth 10 15 harmonically, by the number 12, and you will have the minor third 10 12, and the major third 12 15. Lastly, divide the major third 72 90, and the tone major 80 90, or 8 9, &c. It should be remembered, that these harmonical divisions give two unequal intervals, of which the least is the grave and the greatest the acute. That if we make the same divisions in arithmetic proportion, we shall have the smallest interval in the acute and the greatest in the grave. Thus the octave 2 4, divided arithmetically, will first give the fifth 2 3 in the grave, then the fourth 3 to 4 in the acute. The fifth 4 6 will first give the major third 4 5 ; then the minor third 5 6, and so on. We shall have the same ratios in a contrary sense, if, instead of taking them as we have just done, by the vibrations, we should calculate from the length of the strings. These discoveries, indeed, are of little use in them-

selves on keyed instruments, but they are necessary to the perusal of old authors. The complete and rigorous system of the octave is composed of three major tones and two minor. The tempered system is composed of five equal tones, and two semitones, forming altogether as many diatonic degrees upon the seven sounds of the gammut, till arrived at the octave of the generator or first sound. But as each tone may be divided into two nominal semitones, the same octave divides itself also chromatically into twelve intervals of a semitone each, of which the seven preceding keep their names, and the five others take the name of the next diatonic sound below by a sharp and above by a flat. See SCALE.

We do not speak here of diminished or superfluous octaves, because this interval admits of no alteration either in the melody or harmony.

It is forbidden in composition to admit of two successive octaves between two different parts, especially by similar motion ; but that is admitted, and with an elegant effect, when done with design and propriety through a whole air or period : thus, in many concertos all the ripieno parts play in octaves or unisons.

OCTAVE, concerning the règle de l'octave, see RÈGLE or RULE.

OCTAVE, *Diminished*. See DIMINISHED *Octave*, and INTERVAL.

OCTAVE, or *Octabis*, in *Law*, denotes the eighth day after any feast, inclusively ; which space is also called *utaz*.

OCTAVE, among the Romanists, is used for the space or period of eight days allowed for the celebration of a feast, or service, in commemoration of some saint, or on other solemn occasions.

Easter, Whitsuntide, St. John Baptist, St. Laurence, Epiphany, the Dedication, &c. are celebrated with octaves. The office in the octave is semi-double.

OCTAVIA, in *Biography*, a Roman lady distinguished for her virtues and accomplishments, was the daughter of Caius Octavius, the father of the emperor Augustus. Suetonius indeed says, she had the same mother with that emperor, but according to Plutarch, she was the daughter of a former wife of Octavius. She was accordingly either sister or half-sister to the emperor. She was first married to Claudius Marcellus, by whom she had two children before his death, which happened a little after the war of Persia, when she was pregnant of a third child. After this she married the triumvir Mark Antony, as the medium of reconciliation between him and her brother. At this time she was extremely beautiful, universally respected and esteemed, and tenderly beloved by her brother. Antony had previously to this been captivated by the allurements of Cleopatra, but the merits of Octavia appeared to make a proper impression upon him, and he passed some time in conjugal union with her, during which she bore him two daughters. She accompanied him into Greece, and had a second opportunity of restoring concord between her husband and brother. She returned to Rome, while Antony went into the East ; then it was, says Plutarch, " that the worst of all diseases, love, and the love of Cleopatra, which had lain so long dormant in his breast, and seemed to have given place to the temperate duties of life, upon his approach to Syria, gathered strength, and broke out into a flame : " he had another interview with her, which rivetted his fetters, and sealed his fate. Octavia was soon apprized of his infidelity, but determining he should have no pretence for his misconduct, resolved to omit no duty that became her situation as his wife : she collected considerable supplies for the war, in which he was engaged, and sailed with them

them to Athens. Here she received the mortifying and distressing orders to advance no farther. Despairing now of a renewal of his affection, she returned to Rome. Augustus, extremely enraged at this treatment of a beloved sister, wished to persuade her to retire from the world. But she refused to quit her husband's house, and preserving the dignity of her station, devoted herself to the education of her children, bestowing no less care on those of Antony by Fulvia, than she did upon her own. She readily and liberally entertained all her husband's friends who were sent to Rome on business, and used her best endeavours to promote his interest. His attachment, however, to Cleopatra rendered him insensible to her kindness; he solemnly divorced her and married Cleopatra. The Roman people were not less indignant than her brother at this profligate conduct, which Octavia herself, we are informed, chiefly lamented on this account, that she should become one of the causes of a civil war. After the death of her unfeeling husband, she even undertook the care of his children by Cleopatra, and married the daughter to Juba, king of Mauritania. Her own son Marcellus lived to be the hope of the empire, and was considered as the heir of Augustus, but his untimely death threw the mother into a state of dejection, bordering upon absolute despair, from which she never recovered. The effect upon her of Virgil's beautiful lines, in the sixth *Æneid*, in commemoration of that lamented youth, is highly characteristic of a mother's feelings. When the poet, reciting them in her presence, came to the name of Marcellus, artfully suppressed, to make the close and climax of the passage, Octavia fainted away. On her recovery, she expressed her gratitude for so noble an effort of genius consecrated to her sorrow, by a most munificent recompence. Octavia survived the loss of her beloved son about twelve years, the whole of which she spent in mourning, refusing that consolation which her other children were capable of affording, and remaining in darkness and solitude. She died in the year 11 before the birth of Christ, and very extraordinary honours were paid to her memory by her brother and the senate. See the article ANTONY. Suetonius. Plutarch.

OCTAVIER, Fr. in *Music*. When a wind instrument is over blown, the tone instantly breaks into the octave. This is what the French verb *octavier* implies. In thus forcing the inspiration, the air inclosed in the tube, and contrained by the outward air, is obliged to give way to the velocity of the oscillations, and to divide itself into two equal columns, having each half the length of the tube; and thus each of the halves sounds the octave of the whole. A string of a violoncello, upon the same principle, breaks into the octave, when the stroke of the bow is too violent, or too near the bridge. It is one of the defects of an organ, when a pipe has too much or too strong a wind to give the octave instead of the real sound.

OCTAVINA, in the *Italian Music*, a kind of small spinet, easily moved, having only one row of keys, and those not to the usual number, perhaps not more than three, the common ones extending to five. See **SPINET**.

OCTELINE, another appellation for the same diminutive kind of instrument.

OCTEVILLE, in *Geography*, a town of France, in the department of the Channel, and chief place of a canton, in the district of Valognes. The place contains 850, and the canton 13,303 inhabitants, on a territory of 19 kilometres, in 17 communes.

OCTILE, in *Astrology*. See **OCTANT**.

OCTO, *Ad Octo*. See **AD OCTO**.

OCTO Tales. See **TALES**.

OCTOBER, the eighth month of the year in Romulus's calendar; though the tenth in that of Numa, Julius Cæsar, &c. consisting of thirty-one days.

October has still retained its first name in spite of all the different names the senate and Roman emperors would have given it. The senate ordered it to be called Faustinus, in honour of Faustina, the wife of Antoninus the emperor: Commodus would have had it bear the name of Inviçtus; and Domitian made it be called Domitianus, after his own name.

OCTOBLEPHARUM, in *Botany*, so named from *ὀκτώ*, eight, and *βλεφάρων*, the eye-lash, a genus of Mosses founded by Hedwig, upon the *Bryum albidum* of Linnæus, its only known species. The plan of Hedwig's system required the establishment of this genus, and it happens that nature here confirms his artificial principle. (See **FRINGE of Mosses**, and **HEDWIG**.) Hedw. Sp. Musc. 50. Crypt. v. 3. 15. Bridel. Musc. v. 2. 50. (*Octoblepharis*; Schreb. 758.) Class and order, *Cryptogamia Musci*. Nat. Ord. *Musci*.

Eff. Ch. Fringe of eight simple equidistant teeth. Capsule without an apophysis.

1. *O. albidum*. Hedw. Crypt. fasc. 3. t. 6. f. A. (*Bryum albidum*; Linn. Sp. Pl. 1583. Swartz Obs. t. 11. B. anum, larignis foliis albis; Dill. Musc. 364. t. 46. f. 21.) —Dillenius received this moss from "Providence island in America," but from which of the two islands so named does not appear. Dr. Swartz found it in Jamaica, and we have the same from the East Indies, gathered by Dr. F. Buchanan. The frequent coincidence between the cryptogamic vegetables of the two Indies, is a curious circumstance in the philosophy of botany; as well as that between the aquatic plants of widely distant, and even different, climates. This is a small perennial moss, forming tufts on the trunks of trees, and remarkable for its white, rather opaque, though glittering, colour, with scarcely a tinge of green, in which respects it agrees with our *Dicranum glaucum*, and the *Sphagnum*, or Bog-Moss, absorbing moisture, like them, with the greatest rapidity, though ever so long dried. The leaves are linear, somewhat spatulate, entire, spongy, without any rib, spreading in every direction, scarcely half an inch long. Anthers red, in axillary tufts, surrounded by four leaves. Capsules on the same plant, axillary, elliptical, smooth, pale brown, their stalks about half an inch long, erect. Lid conical, acute, shorter than the capsule. Fringe reddish-brown, its teeth broad at the base, short, acute.

OCTOGON, or **OCTAGON**, in *Geometry*, a figure of eight sides, and eight angles.

When all the sides and angles are equal, it is called a *regular octagon*, or an octagon that may be inscribed in a circle.

To make an octagon on a given line AB. Erect AF and BE (*Plate X. Geometry, fig. 8.*) perpendicular to AB: produce AB both ways, and bisect the angles *m* AF and *n* DE with the lines AH and BC, each equal to AB: draw CD and HG parallel to AF or BE, and each equal to AB: with the radius AB, and on the centres G and D, describe arcs intersecting AF and DE in F and E: then join GF, FE, ED, and AHGFEDCB is the figure required. In or about a given circle, to describe a square, or an octagon; draw two diameters, AB, CD, perpendicular to each other; then connect their extremities, and we shall have the inscribed square ACBD: also through their extremities draw tangents parallel to them, and they will form the outer square *mno p*. If any quadrant, as AC, be bisected in *q*, it will give one-eighth of the circum-

circumference, or the side of the octogon. To find the area of an octogon, see POLYGON.

OCTOGON, in *Fortification*, denotes a place that has eight bastions. See BASTION.

OCTOPHORUM, among the *Ancients*, a carriage with eight wheels.

It also signified a chair, or litter, *lectica*, carried by eight chairmen, which kind of chair was mostly used by the women.

OCTOPITARUM, in *Ancient Geography*, a promontory of Albion, which is evidently St. David's Head in Pembrokehire.

OCTOSPORA, in *Botany*, from *οκτω*, eight, and *σπορος*, a seed, a genus of *fungi* established by Hedwig, of which he gives the following character, in his *Crypt.* v. 2. 4.

"Trunk perfectly simple, terminated by a fertile surface, which is either concave, flat, or reflexed; and out of which proceed very numerous, elongated, delicately membranous seed-cases, generally surrounded with a filamentous substance, not connected among themselves, each of them producing eight seeds."

Schreber adopts this genus, in his *Gen.* 770, but the professed writers on *Fungi*, though usually so prolific in genera, entirely neglect this, retaining the plants which compose it in the established genus of *Peziza*, to which they properly belong. Indeed the character of the seeds and their cases is exactly the same as in the old genus *Lichen*, or rather in nearly the whole of the natural order of LICHENES; see that article. We do not mean that this would be any objection to its distinguishing a genus of *Fungi*, having no other character in common with the *Lichenes*, were it wanted for that purpose. See PEZIZA.

OCTOSTYLE, in the *Ancient Architecture*, the face of a building, or ordonnance, containing eight columns.

The eight columns of the octostyle may either be disposed in a right line, as in the Pseudodiptere temple of Vitruvius, and in the Pantheon; or in a circle, as in the round Monoptere temple of Apollo Pythius at Delphi, &c.

OCTUNX, a word used by some dispensatory writers to signify eight ounces.

OCULATA, in *Ichthyology*, a name given by many to the fish more usually called *melanurus*. It has the name *oculata*, from the remarkable largeness and fine golden iris of its eye. See SPARUS *Melanurus*.

OCULATUS LAPIS, the *Eyed-stone*, in *Natural History*, a name given by Mercatus, in his "*Metallototeca Vaticana*," and, by many other writers, to what we call the *pudding-stone*, a stone formed of a great number of pebbles, of a small size, immersed, and formerly bedded in a stony cement, little less hard than the stones themselves, and in some species not at all so. The resemblance of these round pebbles, when the mass was cut, to the eyes of animals, probably gave origin to this name.

OCULI, EYES, in *Botany*, the gemmæ or buds of a plant just putting forth, or the knots out of which those buds arise.

OCULI, *Abductor*, *Depressor*, *Elevator*, and *Obliquus*, in *Anatomy*. See the respective articles.

OCULI *Speculum*. See SPECULUM.

OCULIST is a name appropriated to a surgeon, who applies himself particularly to the study and cure of diseases of the eye.

OCULO-MUSCULARES, in *Anatomy*, the nerves of the third pair, which supply the muscles of the eyes. (See NERVE.) It is also called motor oculi.

OCULUS. See EYE.

OCULUS *Beli*, in *Natural History*, the name of one of the

semi-pellucid gems of the genus of the *Hydrophanæ*, or the greyish-white hydrophanes variegated with yellow, and with a black central nucleus.

It is a very elegant and beautiful gem; its basis, or ground, is a whitish-grey, variegated with yellow, and sometimes with red, and a little black, but that more rarely, and is found in small masses from half an inch to an inch in diameter; of a rounded figure, and thickest in the middle, tapering away gradually to the sides; the outer part of the stone, or that towards the edges all round, is ever of a whitish-grey, more or less variegated with yellow, &c. and its central nucleus is always of a deep and fine black, surrounded by a broad circle, of a pale yellow, and representing very beautifully the pupil and iris of the eye; these are enclosed in the matter of the stone, and are often surrounded by other very fine concentric circles, of a pale flame-colour; but more frequently there is only the black pupil, surrounded by the yellow iris, and that placed in the body of the stone which represents the white of the eye; the shape of the stone also favours its resemblance of an eye, and the whole is very elegant. It is of the hardness of the agate, and takes a tolerable polish; when thrown into water, it has, in a great measure, the property of the oculus mundi, the whole stone becomes greatly more bright and lucid, and the grey part becomes of a plainly yellowish cast.

There are many things improperly called oculus beli by our jewellers, but the genuine species is very rare. Nothing is more common than to find in the agates little circular veins of different colours round a central spot; these the lapidaries frequently cut out, with a proper quantity of the stone about them, and call them oculus beli. They are not peculiar to the agate, but are common also in the cornelian, and stand sometimes single, sometimes two or three together, and according to the colours of the circles, represent the eyes of various animals. See GEM.

OCULI *Cancrorum*. See CRAB'S EYES.

OCULUS *Cati*. See ASTERIA and GEM.

OCULUS *Christi*, in *Botany*, a name given to a species of clary, from the supposed virtues of its seeds in clearing the sight, which it does by its viscos covering; for when any thing happens to fall into the eye, if one of these seeds is put into one corner, and the eye-lid kept close over it, moving the seed gently along the eye, whatever happens to be there will stick to the seed, and so be brought out.

OCULUS *Leporinus*, a distemperature of the eyes, called also *etropium*.

OCULUS *Marinus*, the *sea-eye*, a name given by some authors to the umbilicus marinus, from its resemblance to the shape of an eye.

OCULUS *Mundi*, in *Natural History*, the name of one of the semi-pellucid gems of the genus of the *Hydrophanæ*. It is of one plain and uniform colour, which is a whitish-grey, and has no veins, or other variegations. It is found in small masses, of the shape of our common flints and pebbles; it has but a very obscure degree of transparence, and is not capable of a fine polish. This stone, however, though of little beauty, has this very singular property, that, when thrown into a basin of water, in the space of half a minute it begins to change its appearance, and very soon, instead of a pale grey, becomes of a very bright, and considerably pellucid, pale yellow, like that of amber, or the yellow cornelian; this it retains as long as it remains in the water, but as soon as taken out and dried, it resumes its grey colour, and becomes as opaque as before. It is found, so far as is yet known, only in China; but the shores of some of our own rivers afford us stones coming up to its qualities
in

in some degree, though not so beautifully transparent in water as the oriental. See *GEM (opal)*.

OCULUS Veneris, a name given by some to the umbilicus marinus.

OCUMARA, *Bay of*, in *Geography*, a bay of the province of Caraccas, in Terra Firma, South America, 5 leagues E. of Porto-Cabello, which is a very good and well-sheltered port. It has excellent moorings; and the port is defended, on the E., by a battery mounting eight pieces of cannon. The village of Ocumara is at the distance of one league from the port, and is watered by a river of the same name, which, after fertilising its vallies, discharges itself into the same bay at the bottom of the fort. Between the bay of Ocumara and that of Guayra, are several small ports, where the inhabitants of that coast ship their commodities for Guayra, or Porto-Cabello; but none of them very important. Dupons's Travels, vol. i.

OCUNHAZARY, a town of Bengal; 20 miles N.N.W. of Ramgur.

OCYMOPHYLLON, in *Botany*. See *ISNARDIA*.

OCYMUM. See *OCIMUM*.

OCZE, in *Geography*, a town of European Turkey, in Moldavia; 44 miles W.N.W. of Birlat.

OCZYCE, a town of Lithuania; 40 miles S.E. of Minsk.

ODA, in the *Turkish Seraglio*, signifies a class, chamber, or order.

The grand signior's pages are divided into five classes, or chambers, called *odas*. See *PAGE*.

The first, which is the lowest in dignity, is called the *great oda*, from the number of persons that compose it.

These are the juniors, who are taught to read, write, and speak the languages; which are, the Turkish for this world; the Arabic for paradise; and the Persian for hell, by reason of the heresy of the people that speak it.

The second is called the *little oda*; where, from the age of fourteen or fifteen years, the youth are trained up to arms, and the study of such polite learning as the Turks are acquainted with; viz. logic, arithmetic, geometry, and a little astrology.

In each of these chambers is a page of the privy-chamber, who superintends them, as the prefects in the colleges of the Jesuits.

The third chamber, called *kilar-oda*, comprehends two hundred pages; which, besides their other exercises, are commanded by the *kilerdgi-bachi*, for the service of the buttery and fruitery.

The fourth only consists of twenty-four; these, under the *khazineda-bachi*, take care of the treasure in the grand signior's apartment, where they never enter with any clothes on that have pockets.

The fifth is called *khas-oda*, i. e. privy chamber, and consists of forty pages, which attend the emperor's bed-chamber. The first of this chamber is called *oda bachi*, the second *sikhtar*, &c.

Eight of these pages keep constant guard every night in the emperor's bed-chamber: they are posted in several places, some nearer him, others farther off, according to their degrees in the chamber. They are to take care the lights, kept constantly in the chamber, do not glare in his eyes, and awake him; and if they find him disturbed with any troublesome dream, to take care he be awaked by one of the agas.

ODABACHI, or *ODABASSI*, an officer in the Turkish soldiery, equivalent to a serjeant or corporal among us.

The common foldiers, and janizaries, called *oldachis*, after having served a certain term of years, are always preferred,

and made *biquelairs*; and of *biquelairs*, in time, become *odabachis*, i. e. corporals of companies, or chiefs of certain divisions, whose number is not fixed; being sometimes ten, and sometimes twenty.

Their pay is six doubles *per* month, and they are distinguished by a large felt, a foot broad, and above a foot long, hanging on the back, with two long ostrich feathers.

ODALIKS, so called from the word *oda*, signifying chamber, a denomination given to slaves attached to the seraglio of the grand signior, in contradistinction to those seven, who are selected as his favourites, who participate most commonly in his pleasures, and who sometimes acquire no small degree of influence over public affairs. These are distinguished by the appellation of "*Kadeun*." If one of the *odaliks* be pregnant, she is treated with great attention: the eunuchs serve her with the greatest respect when the sultan has no male children: on the contrary, she finds herself in a very critical situation when he has any by a slave in favour. She is then fortunate if she escape by miscarriage, as the child is smothered at its birth. For one of these *odaliks* to become *kadeun*, an honour very ardently wished by all, it is necessary that the grand signior should send one of the seven favourites to the old seraglio, the place of exile for his women who have misbehaved or have had the misfortune to displease.

ODAVARA, in *Geography*, a town of Japan, in the island of Nippon, situated in the gulf of Jedo; 40 miles S.S.W. of Jedo.

ODD. See *EVENLY*, and *FOOT*.

ODDENA, in *Geography*, a town of Arabia, formerly a splendid city, now in ruins, near Taas.

ODDER, a town of Arabia, in the province of Yemen; 12 miles S. of Wadeij.

ODE, a Greek word implying a melody or song. Rousseau.

ODE, *Oda*, from the Greek *ωδῆ*, *cantus*, *song*, or *singing*, in the *Ancient Poetry*, a song or hymn; or a composition proper to be sung, and composed for that purpose; the singing being usually accompanied with some musical instrument, chiefly the lyre. See *LYRIC Poetry*.

The peculiar and distinguishing character of the ode is, that it is intended to be sung, or accompanied with music; and though this distinction was not peculiar to any one species of poetry, because music and poetry were coeval and originally always joined together, yet after their separation, and when bards produced compositions in verse that were to be recited or read, not to be sung, such poems as were designed to be still joined with music or song, are, by way of distinction, called odes. It is from this circumstance of the ode's being supposed to retain its original union with music, that we are to deduce the peculiar and discriminating qualities of this kind of poetry. Music and song naturally add to the warmth of poetry; and they justify a bolder and more passionate strain than can be supported in simple recitation. From this is formed the peculiar character of the ode. Hence, says Dr. Blair, proceed "the enthusiasm that belongs to it, and the liberties it is allowed to take beyond any other species of poetry. Hence, that neglect of regularity, those digressions, and that disorder, which it is supposed to admit; and which, indeed, most lyric poets have not failed sufficiently to exemplify in their practice. The effects of music upon the mind are chiefly two; to raise it above its ordinary state, and fill it with high enthusiastic emotions; or to soothe, and melt it into the pleasurable feelings. Hence, the ode may either aspire to the former character of the sublime and noble, or it may descend to the latter of the pleasant and the gay; and between these there is, also, a middle region, of the

the mild and temperate emotions, which the ode may often occupy to advantage." The ode, says the learned bishop Lowth,

"With thoughts that breathe, and words that burn,"

although inferior in some respects to the epic or what are called the higher species of poetry, yields to none in force, ardour, and sometimes even in dignity and simplicity. Whilst "the epic accomplishes its design with more leisure, with more consideration and care, and therefore probably with greater certainty,"—"the ode, on the contrary, strikes with an instantaneous effect, amazes, and, as it were, storms the affections. The one may be compared to a flame, which, fanned by the winds, gradually spreads itself on all sides, and at last involves every object in the conflagration; the other to a flash of lightning, which instantaneously bursts forth,

"With instant ruin threats great Nature's frame,
And shoots through every part the vivid flame."

"The amazing power of lyric poetry in directing the passions, in forming the manners, in maintaining civil life, and particularly in exciting and cherishing that generous elevation of sentiment, on which the very existence of public virtue seems to depend, will be sufficiently apparent by only contemplating those monuments of genius, which Greece has bequeathed to posterity." Among them we may reckon first and principally, and almost solely, the poems of Pindar. The nature of the ode sufficiently expresses its origin: it was the offspring of the most vivid and the most agreeable passions of the mind, of love, joy and admiration; and accordingly it must have been coeval with the first creation of man. Sentiments corresponding to such a composition evidently dictated the hymn which occurs in the xlviiith psalm; and which is most elegantly imitated and put into the mouth of Adam by Milton (*Parad. Lost*, b. v.), who is justly accounted, says the learned prelate now cited, the next in sublimity to those poets who wrote under the influence of divine inspiration. If we appeal to the common testimony of history we shall find that, among every people not utterly barbarous, the use of music and poetry, in the celebration of their religious mysteries, has prevailed from the first periods of society. Plato assigns the first rank to that sacred melody which assumed the form of addresses to the Deity, and was distinguished by the appellation of hymns. Accordingly the Salian poems of Numa, composed on the first institution of the religious rites of that wise and learned monarch, are the most ancient of any that occur in the Latin poetry; and the most ancient poem extant, whose date is ascertained, is the thanksgiving ode of Moses on passing the Red sea; the most perfect in its kind, and the true and genuine effusion of the joyful affections. Thus the origin of the ode may be traced into that of poetry itself, and appears to be coeval with the commencement of religion, or more properly the creation of man. The Hebrews cultivated this kind of poetry more than any other, and are allowed to have excelled in it. Hence we have the triumphal odes of Moses, of Deborah, and of David. Sacred poetry was a principal object of study in the schools of the prophets, which were antecedent to the monarchy for many years, if not coeval with the republic; and young persons thus educated celebrated the praises of Almighty God in lyric compositions, accompanied with music. It was, however, under the government of David, that the arts of music and poetry were in their most flourishing state. (See *HEBREW Music* and *HEBREW Poetry*.) "Of all the different forms of poetical composition," says the prelate, of whose admirable

work we here avail ourselves, "there is none more agreeable, harmonious, elegant, diversified and sublime, than the ode; and these qualities are displayed in the order, sentiments, imagery, diction and verification. The principal beauty of an ode consists in the order and arrangement of the subject;" nevertheless, "the form of the ode is by no means confined to any certain rule for the exact and accurate distribution of the parts. It is lively and unconstrained: when the subject is sublime, it is impetuous, bold, and sometimes might almost deserve the epithet licentious as to symmetry and method; but even in this case, and uniformly in every other, a certain facility and ease must pervade the whole, which may afford at least the appearance of unaffected elegance, and seem to prefer nature to art. This appearance is best preserved by an exordium plain, simple, and expressive; by a display and detail of incidents and sentiments rising delicately and artfully from each other, yet without any appearance of art; and by a conclusion not pointed or epigrammatic, but finishing by a gentle turn of the sentiment where it is least expected, and sometimes as it were by chance," in which latter respect the best Arabic odes are entitled to peculiar commendation.

"It is not the metre or verification which constitutes this species of composition; for unless all these circumstances be adverted to, it is plain that whatever be the merit of the production, it cannot with any propriety be termed an ode. Many of the odes of Horace are entirely in this form, as well as almost all of those few which our countryman Hanmer has left behind him." "The sentiments and imagery must be suitable to the nature of the subject and the composition, which is varied and unconfined by strict rule or method. On familiar subjects, they will be sprightly, florid, and agreeable; on sublime topics, solemn, bold, and vivid; on every subject highly elegant, expressive, and diversified. Imagery from natural objects is peculiarly adapted to the ode; historical common-places may also be admitted, as well as descriptions lively but short, and (when it rises to any uncommon strain of sublimity) frequent personifications. The diction must be choice and elegant; it must be also luminous, clear, and animated; it must possess some elegancies peculiar to itself, and be as distinct from the common language of poetry, as the form and fashion of the production is from the general cast of poetical composition. In this that happiness of expression, for which Horace is so justly celebrated, wholly consists. A sweetness and variety in the verification are indispensable, according to the nature of the language, or as the infinite diversity of subjects may require." In the Hebrew ode the numbers or verification were probably accommodated to the music, and agreeable to the genius of the language; but this is a circumstance concerning which we cannot form any decisive judgment. In every other respect, such as the force and elegance of the language, the beauty and dignity of the sentiments and imagery, the different graces and excellencies of order and arrangement, bishop Lowth does not hesitate in preferring the Hebrew writers to the lyric poets of every other nation. Our learned author distributes all the diversities of this species of composition into three general classes. "Of the first class, the general characteristic will be sweetness; of the last, sublimity; and between these we may introduce one of a middle nature, as partaking of the properties of both. The qualities which may be accounted common to all the three classes, are variety and elegance." To the first of these classes Michaelis refers the *Palms of David*. See *PSALMS*.

"The sweetness of the Hebrew ode consists in the gentle and tender passions which it excites; in the gay and florid imagery, and in the chaste and unostentatious diction which

it employs. The passions which it generally affects are those of love, tenderness, hope, cheerfulness, and pensive sorrow. In the 63d psalm, the royal prophet, supposed to be then an exile in the wilderness, expresses most elegantly the sentiments of tenderness and love. The voice of grief and complaint is tempered with the consolations of hope in the 80th psalm; and the 92d consists wholly of joy, which is not the less sincere, because it is not excessive. The sweetness of all these, in composition, sentiment, diction, and arrangement, has never been equalled by the finest productions of all the Heathen muses and graces united." Other psalms particularly entitled to notice and commendation for their peculiar and discriminating excellencies, are the 23d, the 65th, the 72d, and the 133d. This latter is produced by our author as a specimen, expressive of the true lyric form and character, and compressing in a small compass all the merits and elegance incidental to that species of composition. "It is," he says, "if I may be allowed the expression of a very polite writer,

"A drop of Helicon, a flower
Cull'd from the Muse's favourite bower."
Callimach. Hymn. in Apoll. v. 112.

This psalm is one of the fifteen which are entitled "Odes of the Ascensions;" that is, which were sung when the people came up either to worship in Jerusalem at the annual festivals, or perhaps from the Babylonish captivity. The return is certainly called "the *ascension* or *coming up* from Babylon." Ezr. vii. 9.

One of the grand divisions of the order of poems now under consideration, which is constituted by that middle style of composition, to which we have above referred, may include both those lyric compositions, in which sweetness and sublimity are so uniformly blended, that every part of the poem may be said to partake equally of both; and those, in which these qualities separately occur in such a manner that the complexion of the poem is altogether changed and diversified. As examples of each species we may refer to the 91st psalm, which is supposed to excel the third ode of the fourth book of Horace (though justly celebrated), as well in grace and elegance, as in force and dignity; and the 81st psalm, which affords a correct idea of this kind of poem, so that any one who makes himself master of its general character, genius and arrangement, will feel perfectly satisfied concerning the nature and form of a perfect ode. "In both these specimens, the style and cadence of the whole poem flow in one equal and uniform tenour: but there are others, which are more changeable and diversified, more unequal both in style and sentiment. These, though they occasionally incline to the character of sweetness, and occasionally to that of sublimity, may nevertheless, (though upon a different principle,) be properly classed among the odes of this intermediate style. Such are those which, from a mild and gentle exordium, rise gradually to sublimity, both in the subject and sentiments; such also are those which commence in a mournful strain, and conclude with exultation and triumph. Such, in fine, are all those in which the style or matter is in any respect diversified and unequal. This inequality of style is perfectly consistent with the nature of lyric composition, for variety is one of the greatest ornaments, if not essentials, of the ode." (See *HEBREW Poetry*.) "The 77th psalm will afford some illustration of what has been remarked concerning the nature and economy of the Hebrew ode. This psalm is composed in what I call the intermediate style, and is of that diversified and unequal kind, which ascends from a cool and temperate exordium, to a high degree of sublimity." On the other hand, the 19th psalm is composed

upon a different plan; "for it declines gradually from an exordium uncommonly splendid and sublime, to a gentler and more moderate strain, to the softest expressions of piety and devotion. The whole composition abounds with great variety, both of sentiment and imagery."

Of the sublimity which is characteristic of a third species of the Hebrew ode, and which results either from the plan, the order and arrangement of the poem, or from the sentiments and the style, or from an union of all, when an aggregate perfection is produced from the beauty of the arrangement, the dignity of the sentiments, and the splendour of the diction, we have examples in the 50th psalm, the 24th psalm, and the thanksgiving ode of Moses, composed after passing the Red sea (Exod. xv.) already mentioned, and the 29th psalm. As specimens of that kind of ode which derives sublimity from several united causes, from the diction, the sentiments, the form and conduct of the poem, and which accumulates, or in a manner condenses and combines all the beauties and elegancies of this style of composition, we may mention the prophetic ode of Moses (Deut. xxxii.), the triumphal ode of Deborah, the prayer of Habakkuk (ch. iii.), and the triumphal song of the Israelites on the destruction of Babylon (Isaiah, xiv.)

"All odes," says Dr. Blair, "may be comprised under four denominations. 1. Sacred odes; hymns addressed to God, or composed on religious subjects. Of this nature are the Psalms of David, which exhibit to us this species of lyric poetry in its highest degree of perfection. 2. Heroic odes, which are employed in the praise of heroes, and in the celebration of martial exploits and great actions. Of this kind are all Pindar's odes, and some few of Horace's. These two kinds ought to have sublimity and elevation for their reigning character. 3. Moral and philosophical odes, where the sentiments are chiefly inspired by virtue, friendship, and humanity. Of this kind are several of Horace's odes, and several of our best modern lyric productions; and here the ode possesses that middle region which it sometimes occupies. 4. Festive and amorous odes, calculated merely for pleasure and amusement. Of this nature are all Anacreon's; some of Horace's; and a great number of songs and modern productions, that claim to be of the lyric species. The reigning character of these ought to be elegance, smoothness, and gaiety." Lowth's *Lectures on the Sacred Poetry of the Hebrews* by Gregory, vol. ii. Blair's *Lectures*, vol. iii.

ODE, in the *Modern Poetry*, is a lyric poem, consisting of long and short verses, distinguished into stanzas, or strophes, wherein the same measure is preserved throughout.

The ancient ode had originally but one stanza, or strophe; but was at last divided into three parts; *strophe*, *antistrophe*, and *epode*. The priests going round the altar, singing the praise of the gods, called their first entrance *strophe*, i. e. turning to the left; the second, turning to the right, they call *antistrophe*, q. d. returning: lastly, standing still before the altar, they sung the remainder; which they called *epode*.

The odes of the ancients, Vossius observes, had a regular return of the same kind of verse, and the same quantity of syllables, in the same place of every similar verse: "But there is nothing (says he) but confusion of quantities in the modern odes; so that, to follow the natural quantity of our syllables, every stanza will be a different song."

He should have observed, however, that all the ancient odes were not of such kind. But he proceeds: "The moderns have no regard to the natural quantity of the syllables, and have introduced an unnatural and barbarous variety

riety of long and short notes; which they apply without any regard to the natural quantity of syllables: so that it is no wonder our vocal music has no effect." *De Poem. Cantu.*

Among the ancients, ode signified no more than a song; with us, they are different things. The ancient odes were generally in honour of their gods, as are many of those of Pindar and Horace; sometimes on other subjects, as those of Anacreon, Sappho, &c. The English odes are generally composed in praise of heroes, and great exploits; as those of Dryden, Prior, &c.

The distinguishing character of the ode, as we have observed in the preceding article, is *sweetness*; the poet is to sooth the minds of his readers by the variety of verse, and the delicacy of words; the beauty of numbers, and the description of things most delightful in themselves. Variety of numbers is essential to the ode. At first, indeed, the verse of the ode was but of one kind; but for the sake of pleasure, and the music to which they were sung, they by degrees so varied the numbers and feet, that their kinds are now almost innumerable.

Modern lyric writers assume to themselves an extravagant liberty in their versification; they prolong their periods to such a degree, they wander through so many different measures, and employ such a variety of long and short lines, corresponding in rhyme at so great a distance from each other, that all sense of melody is utterly lost. Whereas lyric composition ought, more than any other species of poetry, to pay attention to melody and beauty of sound; and the versification of those odes may be justly accounted the best, which renders the harmony of the measure most sensible to every common ear.

Pindar, the great father of lyric poetry, by the boldness and rapidity of his flights, has been the occasion of leading his imitators into some of the defects, with which they are chargeable. His genius was sublime; his expressions are beautiful and happy; his descriptions picturesque. Finding it, however, a very barren subject to sing the praises of those who had gained the prize in the public games, he is perpetually digressive, and fills up his poems with fables of the gods and heroes, that have little connection either with his subject, or with one another. Although he was greatly admired by the ancients, he is now so obscure, partly from his subjects in a great degree unknown to us, and partly from his rapid and abrupt manner of treating them, that, notwithstanding the beauty of his expressions, our pleasure in reading his poems is much diminished. Many of his imitators seem to have thought that the resemblance of his disorder and obscurity was the best method of imitating and indicating his spirit. Euripides and Sophocles, in several of their choruses, have the same kind of lyric poetry with Pindar, carried on with more clearness and connection, and at the same time with much sublimity.

"Of all the writers of odes," says Dr. Blair, "ancient or modern, there is none that, in point of correctness, harmony, and happy expression, can vie with Horace. He has descended from the Pindaric raptures, to a more moderate degree of elevation; and joins connected thought and good sense with the highest beauties of poetry. He does not often aspire beyond that middle region, 'which belongs to the ode;' and those odes, in which he attempts the sublime, are not always his best. The peculiar character, in which he excels, is grace and elegance; and in this style of composition, no poet has ever attained to a greater perfection than Horace. No poet supports a moral sentiment with more dignity, touches a gay one more happily, or possesses the art of trifling more agreeably, when he chuses to trifle. His language is so fortunate, that with a

single word or epithet, he often conveys a whole description to the fancy. Hence he ever has been, and ever will continue to be, a favourite with all persons of taste. Among the poets of later days, there have been many imitators of Horace." The most distinguished is Casimir, who wrote four books of odes; but in graceful ease of expression, he is far inferior to the Roman: he more frequently affects the sublime, and in the attempt, like other lyric writers, often becomes harsh and unnatural. On several occasions, however, he manifests much original genius and poetical fire. Buchanan, in some of his lyric compositions, is very elegant and classical. "Among the French, the odes of Jean Baptiste Rousseau have been much and justly celebrated. They possess great beauty both of sentiment and expression. They are animated, without being rhapsodical; and are not inferior to any poetical productions in the French language. In our own language we have several lyric compositions of considerable merit. Dryden's ode on St. Cecilia is well known. Mr. Gray is distinguished in some of his odes, both for tenderness and sublimity; and in Doddsley's *Miscellanies*, several very beautiful lyric poems are to be found. As to professed Pindaric odes, they are, with a few exceptions, so incoherent as to be seldom intelligible. Cowley, at all times harsh, is doubly so in his Pindaric compositions. In his Anacreontic odes he is much happier: they are smooth and elegant, and, indeed, the most agreeable, and the most perfect, in their kind, of all Mr. Cowley's poems." In those odes, says Dr. Johnson, where Cowley chooses his own subjects, he sometimes rises to dignity truly Pindaric.

ODE, *Alcaic*. See *ALCAIC*.

ODEH, in *Geography*, a town of Hindoostan, in the subah of Agimerc; 14 miles E. of Rantampour.

ODEIDA, a town of Arabia, in the province of Yemen; 80 miles N.E. of Aden.

ODEMIRA, a town of Portugal, in Alentejo; 24 miles S.W. of Ourique.

ODENATUS, in *Biography*, king of Palmyra, was originally a native and leading inhabitant of that commercial city; though some make him a prince of a tribe of Saracens, who dwelt in the neighbourhood of the Euphrates. After Sapor, king of Persia, had rendered himself formidable throughout the East, by the defeat of the Roman emperor Valerian, A.D. 260, he received from Odenatus a present of several camels laden with rich merchandize, accompanied with a submissive letter, protesting that he had never borne arms against the Persians. Sapor was enraged that he should presume to write to him, and threatened to destroy him, and exterminate his whole family, unless he came, and, with his hands tied behind him, solicited forgiveness. Odenatus spurned the conditions, and collecting an army, declared for the Romans. To him is ascribed the success of an expedition, in which Sapor's treasure, and several of his wives and children, were captured; and so closely did he press upon the Persian, that he forced him to retreat, and cut off his rear in passing the Euphrates. After these exploits, Odenatus assumed the title of king of Palmyra, and elevated his wife, the celebrated Zenobia, to the rank of queen. Gallienus, the son and colleague of Valerian, entrusted Odenatus with the chief command of the Roman army in the East. In this quality he entered Mesopotamia, defeated Sapor in his own country, and laid siege to Ctesiphon. Thus he had ample opportunity of making the haughty Persian repent of the indignity with which he had treated him. In the following distracted state of the Roman empire, when such a number of rivals to Gallienus arose, that the period is called that of the thirty tyrants, Odenatus preserved

preserved his fidelity, and kept the East in a state of tranquillity. On this account he was created Augustus, and partner in the empire, by Gallienus, in the year 264. Zenobia was dignified with the title of Augusta, and their children with that of Cæsar. In a second incursion into the territories of Sapor, he ravaged the country, and took the city of Ctesiphon. On his return from this expedition, he marched against the Goths or Scythians, who had invaded Asia, and obliged them to make to a hasty retreat. Shortly after this he fell a victim to domestic treason, and his favourite amusement of hunting was the occasion of his death. His nephew, Mæonius, presumed to throw his javelin before that of his uncle; and though admonished of his error, repeated the same. Odenatus was provoked at this show of insolence, took away his horse, a mark of infamy among the barbarians, and ordered the youth into confinement for a short time. The offence was soon forgotten, but the punishment was remembered, and Mæonius caused his uncle to be assassinated in the midst of a great entertainment. Herod, the son of Odenatus by a former wife, was killed with his father. This tragedy is said to have been acted at Emessa, in the year 267. Odenatus was a prince of great qualities, and one who well merited the high rank to which he had raised himself. Univer. Hist. Gibbon.

ODEN-HOTUN, in *Geography*, a town of Asia, in the kingdom of Corea. N. lat. $40^{\circ} 15'$. E. long. $124^{\circ} 53'$.

ODENKIRCHEN, a town of France, in the department of the Roer, and chief place of a canton, in the district of Crèvelde. The place contains 1627, and the canton 16,295 inhabitants, in 22 communes.

ODENSALA, a town of Sweden, in the province of Upland; 14 miles S.E. of Upsal.

ODENSEE, a town of Denmark, and capital of the island of Funen, situated on a river which runs into a large bay of the Cattagat, about a mile from the town. It is the see of a bishop, and contains three churches, besides the cathedral, and a town-house. A considerable number of ships trade to and from this town. The king has a palace, and in 1621 Christian IV. erected a college, and liberally endowed it for four professors. Odenfee supplies the greatest part of the army, and especially the cavalry, with all their leather accoutrements, and is particularly famous for gloves. Here are a considerable cloth-manufactory, a sugar-house, a manufactory for soap, several large breweries, corn-mills, and printing-houses. The Danish language is thought to be spoken here in its greatest purity. The number of inhabitants is about 5000; 17 miles from Nyeborg. N. lat. $55^{\circ} 4'$. E. long. $10^{\circ} 24'$.

ODENSHOLM, a small island in the gulf of Finland, near the coast of Russia. N. lat. $59^{\circ} 15'$. E. long. $23^{\circ} 15'$.

ODENSWI, a town of Sweden, in Smaland; 72 miles N. of Calmar.

ODER, a river, which rises in Moravia, about 18 miles N.E. from Olmutz, enters Silesia and the New Mark of Brandenburg; and after passing by several towns, forms a large lake, called the "Frisch Haff," and separating into several branches, discharges itself into the Baltic. At its mouth are two considerable islands, called Ufedom and Woldin. This river is navigable beyond Ratibor.—Also, a river of France, which runs into the sea, nine miles below Quimper, in the department of the Finistère.

ODERBERG, a town of Brandenburg, in the Middle Mark, on the Oder; 25 miles N.W. of Custrin. N. lat. $52^{\circ} 56'$. E. long. $14^{\circ} 5'$.

ODERBERG, or *Bogumin*, a town of Silesia, in the principality of Teschen, on the Oder; 15 miles N.W. of Teschen. N. lat. $49^{\circ} 50'$. E. long. $18^{\circ} 18'$.

ODERLIUNGA, a town of Sweden, in the province of Schonen; 19 miles E. of Engelholm.

ODERNHEIM, a town of France, in the department of Mont Tonnerre, formerly imperial; 13 miles N.W. by W. of Worms. N. lat. $49^{\circ} 45'$. E. long. $8^{\circ} 10'$.—Also, a town of France, in the department of Mont Tonnerre, late in the duchy of Deux Ponts; 25 miles S.W. of Mentz. N. lat. $49^{\circ} 44'$. E. long. $7^{\circ} 37'$.

ODERQUAT, a town of the duchy of Bremen; 15 miles N. of Stade.

ODER SEIFF, a lake of Silesia, in the principality of Breslaw; 2 miles S. of Dyherrenfurth.

ODERZO, a town of Italy, in the Trevisan, formerly episcopal, the see of which was removed to Ceneda. It was anciently a Roman colony, called "Opiturgium," and had a port on the Adriatic, with which it communicated by the lagunes. It contains about 3400 inhabitants; 13 miles N.E. of Trevigio.

ODESCALCHI, MARC-ANTONIO, in *Biography*, a gentleman of Como, in the Milanese, embraced the ecclesiastical profession, and was ordained priest. His relation, cardinal Odescalchi, afterwards pope Innocent XI., persuaded him to come to Rome; but he refused all the honours which his own merit and family connection might have obtained for him, and devoted himself entirely to works of humanity. He sought out and relieved poor families, who were ashamed to beg; found employment for those who were able to work; and took care of the sick and infirm. He turned his own house into an hospital, for the reception of destitute foreigners of every nation indiscriminately, and of the poor from the adjacent country. He himself waited upon, and instructed the objects of his charity, and not only lodged but clothed them. In these and such like generous offices he employed himself till his death in 1670, and he bequeathed all his property for the maintenance of his hospital. The cardinal, his relation, took the institution under his particular care; and when he became pope, rebuilt it magnificently, and enlarged it so as to contain 3000 beds. Moreri.

ODESPUN, or ODESPUNCK, DE LA MECHINIERE, a French priest, and considerable collector of ecclesiastical documents of the 17th century, was a native of Chinon in the Touraine, of the time of whose birth and death nothing is known. He was employed by the French clergy in forming a collection of their memoirs, which was published in two volumes, folio, in the year 1646. He also published "A Collection of the Councils of France, held after that of Trent," which is regarded as a decent continuation of the "Collections" of father Sirmond, in three volumes, folio; and it was succeeded by the "Supplement" of La Lande, in 1666. Odespun published also a work "On the Orders of Chivalry," in several volumes.

ODESSA, in *Geography*, a sea-port town of Russia, in the government of Ekaterinoflav, on the coast of the Black sea, pleasantly situated near the head of a bay between the rivers Dneiper and Dneister, which is rendered a safe and convenient port, and where is formed a harbour, in which ships of no small burden may ride secure from every storm. A mole has been lately constructed, which runs nearly half a verst into the sea: here are other smaller moles, a lazaretto, &c. The roads without the port are safe in summer, and the anchorage is good. This town has scarcely existed ten years, but the population is already upwards of 10,000 persons, and is daily increasing. The houses and magazines are good, and built of free-stone; and the streets are wide, though hitherto unpaved. This place is the summer residence of the Polish nobility, who repair hither for the pleasure of sea-bathing.

bathing. The deputy-governor of the town is an Englishman, formerly a merchant at Naples; and the resident merchants are respectable and hospitable. They consist of persons from various countries. Two English houses are established here, but the principal are Germans and Italians. They carry on a very considerable trade. In the year 1808, it is said that 1000 ships were loaded in this port. Wheat is the only export article, but the imports are trifling. Besides Christians, the Jews form a large part of the population. N. lat. $46^{\circ} 32'$. E. long. $30^{\circ} 38'$.

ODESTAGU, a town of Sweden, in the province of Smaland; 13 miles S.S.E. of Jonkioping.

ODEUM, *ὠδειον*, among the *Ancients*, was a place destined for the rehearsal of the music to be sung on the theatre.

ODEUM was sometimes also extended to buildings that had no relation to the theatre. Pericles built an odeum at Athens, where musical prizes were contended for: Pausanias says, that Herod the Athenian built a magnificent odeum for the sepulchre of his wife.

Ecclesiastical writers also use odeum for the choir of a church.

ODEYGUNGE, in *Geography*, a town of Bengal; three miles N.E. of Toree. N. lat. $23^{\circ} 39'$. E. long. $84^{\circ} 35'$.

ODEYPOUR, a town of Bengal; 13 miles W. of Palamow.—Also, a town of Hindoostan, capital of Jushpour, in the subah of Orissa; 52 miles S. of Surgooja. N. lat. $22^{\circ} 36'$. E. long. $83^{\circ} 35'$.

ODHAL, or **ODEL'S**, *Right*. Pontoppidan, in his History of Norway, p. 290, observes, that in the northern languages, *odh* signifies *proprietas*, and *all*, *totum*. Hence he derives the *odhal* right in those countries, and hence perhaps is derived the *udal* right in Finland. Now the transposition of these northern syllables *allbodh*, will give us the true etymology of the *allodium*, or absolute property of the feudists; as by a similar combination of the latter syllable with *fee*, which signifies a conditional reward or stipend, *feedh*, or *feudum*, will denote stipendiary property. This custom, prevalent in Norway, is a right of inheritance, by which the proprietor of freeholds may repurchase an estate which either he or any of his ancestors have sold, provided he can prove the title of his family. In order to enforce this right, his ancestors, and he, must have declared every tenth year, at the sessions, that they lay claim to the estate, but are unable to redeem it; and whenever he, or his heirs, acquire a sufficient sum, then the possessor must, on receiving the money, relinquish the estate to the "Odel's-man." For this reason, the peasants who are freeholders keep a strict account of their pedigree. This custom is attended with advantages and disadvantages. It fixes the affections of the peasant on his native place, and he improves with pleasure those possessions which are so strongly secured to him, while it increases the consequence and excites the industry of his family. On the contrary, the estate loses its value when sold to another person, because, as the purchaser possesses only a precarious tenure, he is not disposed to improve the lands, as if he possessed the freehold. Cox's Travels in Norway, &c. vol. v.

ODI, in *Geography*, a town of Africa, on the Slave coast.

ODIHAM, a small market town in the hundred of the same name, in the Basingstoke division of Hampshire, England, is situated 24 miles from Winchester, and 42 miles from London. It was formerly a free borough, belonging to the bishops of Winchester. The church is an ancient and spacious structure, built of brick: and near it

is an old almshouse. In the population survey of the year 1811, Odiham is stated to contain 202 houses, occupied by 1104 persons. The poorer class of inhabitants are chiefly employed in spinning worsted and winding silk. At one extremity of the town is a convenient wharf, on the Basingstoke canal, by which all kinds of goods are conveyed to and from London. A market is held on Fridays; and here are two annual fairs. The parish is very extensive, and includes some of the best arable land in this part of the county.

At North-Warnborough, about a mile from the town, are the remains of Odiham Castle, the origin of which was anterior to the reign of King John, when it belonged to the see of Winchester, and became celebrated for its resistance against the army of Lewis, dauphin of France. Here David Bruce, king of Scotland, who was made prisoner at the battle of Neville's Cross, was confined for eleven years, and then released on paying 100,000 marks, and giving hostages for his future conduct. The original extent and form of the castle cannot now be ascertained; the fragments that remain are parts of the keep, which was an octagonal building: some of the ditches may yet be traced.

Nearly two miles from Odiham is Dogmersfield Park, the seat and property of Sir H. Mildmay, bart. The mansion is an extensive brick building, and contains several spacious and elegant apartments, decorated with paintings of the Italian, Venetian, and Flemish schools. In the library is a very valuable collection of books, amounting to upwards of 5000 volumes, among which is a choice selection of topographical works. The park includes seven hundred acres of diversified ground, and is embellished with several new plantations, in addition to its woods of ancient growth. Near the house is a piece of water of about forty-four acres. Adjoining to the park is an extensive common, covered with oak-trees and hollies, and in many parts bearing a striking resemblance to the New Forest. The archbishops of Canterbury had a palace at Dogmersfield as early as the twelfth century. Jocelyn Fitz-Jocelyn, who was translated to that see in 1190, died here the following year. Some extensive foundations, supposed to belong to this building, were recently discovered near the present mansion. Beauties of England, vol. vi. by J. Britton and E. W. Brayley.

ODILO, in *Biography*, a saint in the Roman calendar, a celebrated abbot of Clugny in Burgundy, was the son of Berauld, surnamed the Great, and was born at Auvergne in the year 962. When very young he was distinguished as well by his progress in learning, as by his virtuous manners. Aspiring after a life of perfection, he determined to devote himself to the monastic profession; and in the year 991, after renouncing his country and relations, he took the habit in the Benedictine abbey of Clugny. Here he quickly recommended himself by his literary acquirements, his exact observance of the institutions of the order, his extraordinary piety, and the superiority of his mental endowments, so that before he had completed his probation, the abbot designed him for his successor. In the year 994 this charge devolved on him, when he was only thirty-two years of age, and he performed its duties in a manner worthy of the important trust committed to him, and that reflected the highest credit on his own character and the monastery. The whole of the time which the duties of his station did not demand, he employed in devotion and study, and from what he left behind him it appears that the sacred scriptures occupied a due share of his attention. The reputation which the monastery of Clugny acquired by his discipline, doctrine,

doctrine, and the sanctity of his manners, rendered it the most celebrated of any one in France, or any of the adjoining countries, and induced the most exalted personages to cultivate the acquaintance of the abbot. The emperor Henry, in particular, used frequently to send for him to court, in order that he and his empress Adelaide might be delighted and benefited by his conversation. Hugh Capet, Robert, and Henry, kings of France, several of the kings of Burgundy and Navarre, and Casimir, king of Poland, kept up a correspondence with Odilo, to whom they sent frequent presents in testimony of their veneration for his character. The emperor, in token of his high regard, even sent him his crown of gold, which he sold in a time of general and very great scarcity, in order to provide for the destitute poor. His spirit was, however, so thoroughly disciplined to habits of virtue, that the flattering attentions of the great did not at all minister to his pride. On the contrary, so great were his modesty and humility, that he declined accepting the archbishopric of Lyons, when offered him in the handsomest way, and pressed upon him by pope John XIX. He died at Souvigny in 1048, in the eighty-seventh year of his age. This abbot was the founder of the annual service of the church of Rome in commemoration of the dead. He was author of several works, particularly of the *Lives of St. Mayeul*; *St. Adelaide the empress, consort to the emperor Otho I.*; *Sermons*; *Letters*, &c. His works were collected together and published by Duchesne, in his "*Bibliotheca Cluniacensis*," and thence copied into the 17th volume of the *Bibliotheca Patrum*. Moreri.

ODIN, in *Mythology*, called also in the dialect of the Anglo-Saxons *Woden*, or *Wodan*, a name given by the ancient Scythians to their supreme god, and assumed, about 70 years before the Christian era, by Sigge, a Scythian prince, who conquered the northern nations, made great changes in their government, manners, and religion, enjoyed great honours, and had even divine honours paid him. According to the account given of this conqueror by Snorro, the ancient historian of Norway, and his commentator Torfæus, Odin was a Scythian, who withdrew himself, with many others in his train, by flight, from the vengeance of the Romans, under the conduct of Pompey: and having officiated as priest in his own country, he assumed the direction of the religious worship, as well as the civil government, of the nations which he conquered. Having subdued Denmark, Sweden, and Norway, he retired to Sweden, where he died. There is nothing certain in this account; but it is probable, that the god, whose prophet or priest this Scythian pretended to be, was named Odin, and that the ignorance of succeeding ages confounded the deity with his priest, composing out of the attributes of the one, and the history of the other, the character of the northern conqueror. He deluded the people by his enchantments and skill in magic: having cut off the head of one Mimer, who in his life-time was in great reputation for wisdom, he caused it to be embalmed, and persuaded the Scandinavians that he had restored it to the use of speech; and he caused it to pronounce whatever oracles he wanted. The Icelandic chronicles represent Odin as the most eloquent and persuasive of men: they ascribe to him the introduction of the art of poetry among the Scandinavians, and likewise the invention of the Runic characters. He had also the address to persuade his followers, that he could run over the world in the twinkling of an eye; that he had the direction of the air and tempests; that he could transform himself into all sorts of shapes, could raise the dead, could foretell things to come, deprive his enemies, by enchantment, of health and vigour, and discover all the treasures concealed in the earth.

They add, that by his tender and melodious airs, he could make the plains and mountains open and expand with delight; and that the ghosts, thus attracted, would leave their infernal caverns, and stand motionless about him. Nor was he less dreadful and furious in battle; changing himself into the shape of a bear, a wild bull, or a lion, and amidst ranks of enemies committing the most horrible devastation, without receiving any wound himself. The era of Odin has never been satisfactorily ascertained: nor is it easy to decide which is the most probable of the three suppositions respecting it that are extant. Gräter, with ingenious rashness, supposes the island Sams mentioned in the Edda to be the Samos of the Archipelago; and, from some faint resemblance between the Gothic cosmogony and that of a Samian philosopher, he infers Odin to have been a pupil of Melissus; and thus he throws back his antiquity to a period, which would make it probable that the Scythian kings of Herodotus are the heroes deified in Gothic song. Mallet defends the wilder because wholly baseless conjecture, that the arms of Pompey occasioned Odin to migrate from the Euxine to the Baltic. In this case, Pliny and Tacitus would have met with traces of his progress among the nations whom they describe. Extensive recent conquests, terminating in the imposition of a new religion, could not but live in the memory even of barbarians. It is therefore most probable that Odin is posterior to these writers, and that the Anglo-Saxon historians are correct, who describe Hengist as fifth in descent from Odin, and who have preserved the intervening pedigree. As in pastoral nations marriages take place early, it is unlikely that any progenitor of Hengist should have passed in celibacy his twenty-fifth year. An interval of 125 years is enough to allow between Odin himself and his grandson Vesta's great-grandson, Hengist. This would place Odin in the year of Christ 325, about 70 years before Alaric, and would plausibly account for the momentous impulse which, about that time, propelled the Gothic multitudes against all the provinces of the Roman empire.

Odin is called, in the Edda, and by Snorro, *Runhofdi* and *Runomfauthr*, father of letters, king of spells, as the poets phrase it; which favours the opinion that he introduced the art of writing among the Goths. Now Tacitus expressly pronounces the alphabet to have been unknown to the Germans; *literarum secreta viri pariter ac fame ignoant*: Odin, then, must have lived subsequently to this period. The oldest Runic inscriptions on stone commemorate the fortunes of soldiers who had served at Constantinople in the corps of Varangi; and the art of stone-cutting in the North is therefore posterior to the transfer of the seat of empire from Rome to Constantinople. Now Odin, according to Snorro, first introduced the practice of using grave-stones: in his time, no doubt, they were simply inscribed, not engraved: but these cannot long have preceded the more permanent memorials. This circumstance, again, tends to corroborate a chronology which places Odin at the beginning of the fourth century.

There exists a Russian map of the year 949, (the fac simile may be found in Schlötzer's Northern History, p. 490.) in which the coast of Elthonia is called Ostrogard, or the *East garden*. If the opposite coast of Courland was called Asgard, or the *West garden*, the river Duna which separates them may well have borne the name Mitgard. In Samogetia, various etymological notices unite to indicate the original dwelling-place of Odin: it was natural, after his settlement in Upland, to sing the "glad home" which he had forsaken; to promise a return thither to the spirits of such as fell in battle; and to indicate the rainbow, which is usually seen in the east, as the

bridge which was to direct their path. Monthly Review, vol. xxvii. p. 382. See EDDA, and Mallet's North. Antiq. vol. i. ch. iv. and v.

ODINGTON, WALTER, in *Biography*, a monk of Evesham, in Worcestershire, of whose writing a treatise is preserved in the library of Bene't college, Cambridge, that is so copious and complete, with respect to every part of music when it was written; that if all other musical tracts, from the time of Boethius to Franco and John Cotton, were lost, our knowledge would not be much diminished, if this MS. was accessible.

The ingenious author of this work was eminent in the early part of the thirteenth century, during the reign of Henry III. not only for his profound knowledge in music, but astronomy, and mathematics in general. The translator and continuator of Dugdale's *Monasticon*, speaks of him among learned Englishmen of the order of St. Benedict in the following manner:

"Walter, monk of Evesham, a man of a facetious wit, who applying himself to literature, lest he should sink under the labour of the day, the watching at night, and continual observance of regular discipline, used at spare hours to divert himself with the decent and commendable diversion of music, to render himself the more cheerful for other duties." This apology, however, for the time he bestowed on music, was needless; for it was, and is still, so much the business of a Romish priest, that to be ignorant of it disqualifies him for his profession. And at all times, where an ecclesiastical thought it necessary to trace the whole circle of the sciences, music having the second or third rank, could not be neglected. But what this author adds farther concerning Odington is still less defensible: "Whether," says he, "this application to music drew him off from other studies I know not, but there appears no other work of his than a piece entitled "Of the Speculation of Music." Yet we are told by Pits, Bale, Tanner, Moreri, and all his biographers, that he wrote "De Motibus Planetarum, et de Mutatione Aëris," as well as on other learned subjects. As Walter of Evesham lived at a period which furnishes but few records concerning the state of music in England; and as we are acquainted with no other copy of his MS. than that which is preserved at Cambridge, we shall be somewhat the more minute in describing its contents, and pointing out its peculiarities.

The first page, only, has been injured by time, and some vacuities have been left by the scribe, which seem intended to have been filled up with red ink. The work is divided into six parts, or books.


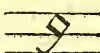





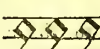


The first, "De Inequalitate Numerorum et eorum habitudine," contains ten chapters, on the division of the scale, and harmonical proportions.

The second part consists of eighteen chapters. In the introduction to this part he calls the concords *symphonies*, which is frequently the language of Hubald, Odo, and Guido. The first chapter is an "Eulogium upon Music," in which he enumerates the nine Muses and their attributes; speaks of David's power over the evil spirit of Saul, by means of his harp; quotes Clemens Alexandrinus, but not in Greek; and after giving the invention of instruments to Tubal, relates the manner in which Pythagoras discovered harmonical proportions by the weights of a blacksmith's hammers. Speaks of major and minor semitones, and of the comma. He has a long chapter on the proportions of the major and minor thirds; here he takes occasion to describe the different kinds of human voices, from the shrill cries of the infant to the deep and dying groans of an old man; but mentions not those of the *evirati*. Accounts for the thirds

having been regarded as discords by the ancients who adhered to the proportions of Pythagoras; and says, that to please in harmony they must necessarily be altered, or, as it was afterwards called, *tempered*. In his seventeenth chapter he gives a list of concordant discords, *concordes discordie*, or the less perfect double sounds; and these he says are six: the minor and major third; the *diapente cum tono*, or major sixth; the two tenths, or octaves of the thirds; and the diapason and diatessaron, or eleventh.

The third part is chiefly speculative, and confined to harmonics: forming the scale, and dividing the monochord, by numbers, and giving rules for the proportions of organ pipes, and the casting of bells. He speaks of the three kinds of melody, "De tribus generibus Cantuæ;" and after describing the diatonic, chromatic, and enharmonic of the ancients, he supports his opinions by the authority of Nicomachus. Greek musical authors, or at least their doctrines and technical terms, seem familiar to Odington, who quoted the first book of Euclid at the beginning of his work, and in this third part he gives the characters and names of the notes in the Greek scale, and translates them into the same language as Martianus Capella and Boethius. In his chapter "De Organis componendi," he gives a diagram of numbers and intervals, in naming which by the letters of the alphabet he begins with the Greek Γ, and goes on from A to S. At the side of the diagram he mentions the Greek names of the several tetrachords and consonances; with the numbers, tones, and semitones. All this is manifestly for the proportions of pipes in the instrument called an *organ*, not the *organum*, or second voice part in disant, of which he treats in his last book, as will appear farther on. This, and his chapter "De Cymbalis faciendis," or casting of bells, are curious, and the first instructions of the kind that we have ever seen among the MSS of the middle ages.

Names and figures occur in this work of such notes as were in use in the Western church before the invention of lines, many of which were not merely characters to express the elevation and depression of sounds, but, according to Odington, these characters extended their import to the inflections of the voice in almost every species of interval, while groups of notes were expressed by a single term of art; and as but few such characters and technical terms occur in any other author, we shall insert, for the satisfaction of curious readers, the following specimens:

Punctum		Apostropha	
Virga		Bispunctum	
Bistropa		Bivergia	
Tripunctum		Tristropa	
Trivergia			
Virga Biconpunctis			Virga Tricon-

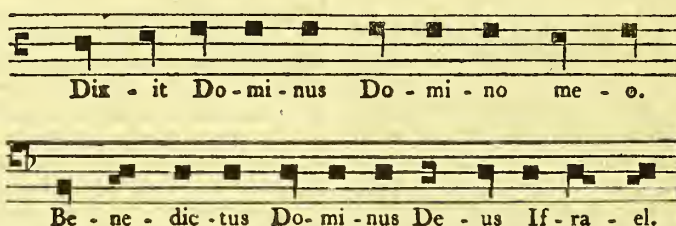
punctis—condiatessaries, condiapectis, &c. &c. He gives examples of all these in similar characters; that is, in breves with a long, as far as six notes, or a hexachord ascending and descending, but without calling them by those names.

The

The following are characters to express wider intervals, and short passages :



He has many more, which seem never to have been adopted by succeeding writers.



The *euouae*, initials, and finals of all the modes, are given in this kind of notation very amply, and always on five lines, and spaces. At the beginning of the last chapter of this book the words *Ananes, Neanes, Nana*, &c. used by Odo and the modern Greeks in their intonations, occur. This seems the most complete description and notation of the ecclesiastical chant that we have found in any author of equal antiquity.

In the sixth and last part, besides the "Cantus Mensurabilis," he treats "De Generibus Cantuum Organorum, et de Compositione Cantuum Organorum," of organizing chants, or the composition of organic or second parts to chants: and first, "De Organo Puro." Here we meet with all the technica of later times, as tenor, motetus, coloratus, cantilena, and rondellus. The musical examples, however, as usual in old manuscripts, are incorrect, and frequently inexplicable, owing to the ignorance of music in the transcribers; but if this tract were corrected, and such of the examples as are recoverable, regulated and restored, it would be the most ample, satisfactory, and valuable, which the middle ages can boast; as the curious enquirer into the state of music at this early period may discover in it not only what progress our countrymen had made in the art themselves, but the chief part of what was then known elsewhere.

ODIO & *Atia*, anciently called *breve de bono & malo*, in *Law*, is a writ directed to the sheriff, to enquire whether a man, being committed to prison on suspicion of murder, be committed on just suspicion, or only malice, and ill will.

ODIR, in *Geography*, a small island in the East Indian sea, near the W. coast of Aroo. S. lat. $5^{\circ} 23'$. E. long. $134^{\circ} 58'$.

ODNESS, a cape of Scotland, on the E. coast of the island of Stronsa. N. lat. $58^{\circ} 59'$. W. long. $2^{\circ} 26'$.

ODO, in *Biography*, a Romish saint and abbot of Clugny

After explaining these characters, he speaks of the modern expedient of naming the sounds from the syllables of the hymn "Ut queant laxis," &c. but without mentioning Guido. Then gives the great system or scale in septenaries, after Guido's manner, in capital, small, and double letters. Here he speaks of *voces mobiles* in the ancient manner, and of *F quadrata*, as used in *musica falsa*, or transpositions, not, says he, "per dissonem, sed extranea et apud antiquos inusitata." Then he has a chapter "De Mutationibus," in which he explains the change of names in solmification in the same manner as was done by succeeding writers long after his time.

The rest of this book is employed in describing different kinds of ecclesiastical chants, and in giving rules for composing them. Then dividing the modes into authentic and plagal, he gives examples of canto fermo, which seem more florid than appear in missals of the same period. The two following intonations, which he gives upon five lines, will serve as specimens :

in the 10th century, was of noble descent, and born in the country of Maine, in the year 879. At the age of nineteen he was made canon of St. Martin's, at Tours, after which he went to Paris, and became a disciple of St. Remi of Auxerre. Having resolved to embrace the monastic life, he, in 912, took the habit in the monastery of Baume, in the diocese of Besançon, where he was distinguished by the practice of the most austere exercises of the cloister, and applied very earnestly to the acquisition of such learning as the ignorance of the times permitted. He was appointed to preside over the school of the monastery, and in 926 he received priests' orders, and in the following year, upon the death of Berno, first abbot of Clugny, he was elected successor in that dignity. At this period the Latin monks had lost sight of all subordination and discipline, and Odo set himself to correct abuses. He not only obliged the monks to live in the regular observance of their rules, but also added to their discipline new rites and ceremonies, which were attended with an air of sanctity, and which were severe and burthenfome. The fame of this new rule of discipline soon spread over Europe, and it was adopted in the greatest part of the ancient monasteries which had been founded in France, Germany, Italy, Britain, and Spain, as well as in the convents which had been newly established. So high was Odo's reputation for wisdom and sanctity, that the popes, the bishops, and the secular princes, paid the utmost deference to his counsels, and frequently constituted him arbiter of their disputes. In 936 he took a journey, and was successful in mediating a peace between Alberic, prince of Rome, and Hugh, king of Italy. Two years after this he went, a second time, to Rome, and by his influence with Hugh, prevailed upon him to withdraw from the siege of the city. In 942 he made a third visit to Rome, purely on religious motives, and while he was in that city he was attacked by a severe disorder, which obliged him to hasten back to France. He died at Rheims, in the

sixty-fourth year of his age. He was author of several works, which are collected in the 17th volume of the *Bibl. Patrum*. Moreri.

Mabillon (*Acta Sanct. ord. 5. Bened. tom. vii. p. 126.*) ranks Odo at the head of literature and the polite arts at the beginning of the tenth century. He studied under St. Remi, at Paris, and, among other sciences, applied himself so successfully to music, that he was afterwards regarded as the most learned musician of his time. He made three several voyages to Rome, in 936, 938, and 942, where, it is natural to suppose, he acquired a perfect knowledge of the Gregorian chant, and was initiated in all the refinements that were then practised in St. Peter's church and the pontifical chapel.

Some of his hymns, chants, and anthems, are still preserved in the Romish church; and there are two copies of a MS. tract upon music, of his writing, in the king of France's library at Paris. They are in separate volumes, and both bound up with many other ancient musical treatises. There is a tract of great antiquity in the library of Balliol college, Oxford, which, by the initial sentence "Quid est musica?" we once imagined to have been written by Odo; but are now convinced that it is the work of Guido himself: for, in carefully perusing, and collating it with the extracts we had made from the *Enchiridion* of Odo, in the libraries of the late king of France, and elsewhere, as well as with the quotations from it in the *Musical Histories* of P. Martini, and the prince Abbot Gerbert, we find it to be totally a different work, agreeing in nothing but the initial question. But the most beautiful and perfect copy which we have seen, and which perhaps can now be found of the scarce and curious tracts upon music, by the venerable monk Hubald, of St. Amand, and St. Odo, abbot of Cluny, subsist in the library of Bene't college, Cambridge.

We come now to the celebrated *Enchiridion* of Odo, which is written in dialogue, and mentioned with respect, even by Guido himself. "Incipit Scholium *Enchiridij de Arte Musica*." The dialogue is between a master and his disciple.

The diagrams and musical examples are all given in the same characters as those of Hubald. His doctrine of the tones, or ecclesiastical modes, is illustrated by innumerable specimens in this kind of notation.

In this treatise, the barbarous and unmeaning words, in Gothic letters, occur, which the Greek church used during the ninth, tenth, and eleventh centuries, to characterise the modes or tones: *Nonanoeane, Noeane, Noioeane, Anois*. The terms like these are still retained by the modern Greeks in their ecclesiastical music, as we find by Leo Allatius, and by the Abate Martini's papers.

The entablature, or notation of Hubald and Odo, very much resemble each other, as does their counterpoint; indeed these ecclesiastics were not only contemporaries and friends, but disciples of Remi, monk of St. German d'Auxerre; and Odo, the youngest of the two, survived Hubald but twelve years.

The first part of this tract ends thus: "Præterea et grata symphoniarum commixtio maximam suavitatem cantilenis adjacet."

And in the second part he proceeds to the explanation of this extraordinary symphonic sweetness; which, he tells his disciple, consists in the pleasing mixture of certain sounds, such as the octave, 5th, 4th, &c.

Then follow examples of organizing in all his six concords, which are only those of the ancients, 4th, 5th, 8th, 11th, 12th, and 15th; and in giving an example in four

parts, where he doubles the organum and principal part to these words, *Nos qui vivimus*, they move constantly in these intervals, unison, 4th, 8th, and 11th.

The author next proceeds to give the ratio of sounds, and to shew the alliance between music and mathematics, calling arithmetic the mother of musical tones.

He afterwards treats of the proportions of flutes or musical pipes, to which he applies his harmonics.

The last chapter is a summary of the tones or modes of canto fermo; and here, as elsewhere, his examples are always in the same hieroglyphic notation: *NO J A F NO I F E F A I f NE—&c.*

This last chapter is not quite perfect; the transcriber having omitted some of the musical examples and diagrams. Only six of the eight modes are finished. The seventh, however, is begun, and not more than one, or two pages at most, can be wanting to complete these two scarce and valuable relics of the first essays at modern harmony; which, however rude, uncouth, and barbarous, continued in the church, without offending Christian ears, for more than three centuries: for the monk Engelbert, who, in the latter end of the thirteenth century, at the instigation of his friends, wrote a treatise on music, tells us, that all regular discent consists of the union of 4ths, 5ths, and 8ths.

It has already been shewn that this kind of harmony, miserable and nauseous as it would be to our palates, did not offend Guido; on the contrary, he recommends the regular succession of fourths above all other concords, to excite and express pleasure and jubilation. Nor do any advances or attempts at variety seem to have been made in counterpoint from the time of Hubald to that of Guido: a period of more than a hundred years.

Indeed it is hardly possible to examine the last specimen of Hubald's counterpoint, without being astonished that no advances had been made in the art for a whole century; for, with all its faults and crudities, it is at least equal to the best combinations of Guido. But perhaps Hubald's inventions or improvements never escaped the confines of his convent, or at most, were only published in his own diocese; and, like the proposals of other ingenious men, whose views are extensive, and who anticipate future discoveries, they were not adopted or reduced to practice in his life-time. His idea that one voice might wander at pleasure through the scale, while the other remains fixed, shews him to have been a man of genius and enlarged views, who disregarding rules, could penetrate beyond the miserable practice of his time into our *points d'orgue, pedalè*, and multifarious harmony upon a holding note or single base, and suggest the principle, at least, of the boldest modern harmony. Odo is the only one of his contemporaries, or successors, whose writings have come to our knowledge, that has imitated his notation.

ODOACER, first barbarian king of Italy, was the son of Edecon, a chieftain of the tribe of the Scyri, who had been in the service of Attila, king of the Huns. After the death of his father, and the dispersion of his nation, Odoacer for some time led a wandering life among the barbarians of Noricum, with a mind and fortune suited to the most desperate adventures; and when he had fixed his choice, he visited the cell of Severinus, the popular saint of the country, to solicit his approbation and blessing. The lowness of the door would not admit the lofty stature of Odoacer: he was obliged to stoop, but in that attitude the saint could discern the symptoms of his future greatness, and addressing him in a prophetic tone, he said, "Pursue your design; proceed to Italy; you will soon cast away this coarse garment of skins;

and your wealth will be adequate to the liberality of your mind." He accepted and ratified the prediction, was admitted into the service of the western empire, and soon obtained an honourable rank in the guards. In the year 476, the barbarian mercenaries in the Roman army demanded a third part of the lands of Italy as a reward for their services, which the patrician Orestes refusing to grant, they unanimously placed at their head Odoacer, and proclaimed him their king. He marched against Orestes, took him prisoner, and put him to death: he next deposed Augustulus, the son of Orestes, who had been placed on the imperial throne of the west by his father, and who was the last that possessed that title. Odoacer spared him on account of his youth, but assumed the government of Italy with the title of king; he abstained during his whole reign from the use of the purple and the diadem, lest he should give offence to those princes, whose subjects, by their accidental mixture, had formed the victorious army, which time and policy might insensibly unite into a great nation. "Royalty," says the historian, "was familiar to the barbarians, and the submissive people of Italy were prepared to obey, without a murmur, the authority which he should condescend to exercise as vicegerent of the emperor of the west. But Odoacer had resolved to abolish that useless and expensive office, and such is the weight of antique prejudice, that it required some boldness and penetration to discover the extreme facility of the enterprize. The unfortunate Augustulus was made the instrument of his own disgrace; he signified his resignation to the senate, and that assembly, in their last act of obedience to a Roman prince, still affected the spirit of freedom, and the forms of the constitution." The precise year in which this event of the extinction of the western empire took place is not ascertained, but it was some time between the years 476 and 479. Odoacer appears to have conducted himself in the exercise of his authority with more justice and moderation, than might have been expected from one who rose to power by such means as he had adopted. He respected the ancient laws and institutions of the country, and caused justice to be strictly administered. After an interval of seven years he restored the consulship of the west. He protected the confines of Italy by his arms, crossed the Adriatic to take possession of Dalmatia, and conquered the king of the Rugians in the province of Noricum. Notwithstanding the prudence and success of Odoacer, his kingdom exhibited the melancholy prospect of misery and desolation. Since the age of Tiberius, the decay of agriculture had been felt in Italy, and it was a subject of just complaint, that the existence of the Roman people depended on the accidents of the winds and waves. The number of the inhabitants continually diminished with the means of subsistence, and the country was exhausted by the irretrievable losses of war, famine, and pestilence. In this state of things, the famous Theodoric, king of the Ostrogoths, was persuaded, by the emperor Zeno, to turn his arms against the king of Italy: he succeeded in his attempt, and overcame him in three obstinate engagements; and in the last he was obliged to make proposals for accommodation, which were readily listened to. This was at Ravenna, the bishop of which city negotiated a peace between the two kings, and it was agreed, under the sanction of an oath, that they should rule with equal and undivided authority the provinces of Italy. After some days had been devoted to the semblance of joy and friendship, Odoacer, in the midst of a solemn banquet, was stabbed by the hand, or at least by the command, of his rival, and at the same time all his officers and mercenaries were massacred. This event happened in March 493. *Univ. Hist. Gibbon.*

ODOEV, in *Geography*, a town of Russia, in the government of Tula, on the Upha; 52 miles W. of Tula. N. lat. 53° 50'. E. long. 36° 14'.

ODOLI-HOTUN, a town of Chinese Tartary. N. lat. 43° 32'. E. long. 127° 38'.

ODONTAGNATHUS, in *Ichthyology*, a genus of fishes of the order Apodes. The generic character is as follows: mouth furnished with strong, moveable laminae, or processes on each side the upper jaw; the gill-membrane is five-rayed. There is but a single

Species.

ACULEATED. This derives its specific name from the aculeated abdomen. The genus was instituted by La Cépède, whose description is as follows. The head, the body, and tail, are very compressed; the lower jaw is longer than the upper, and is much elevated towards the other when the mouth is closed, so as to appear almost vertical, and is lowered somewhat in the manner of a drawbridge, when the mouth is opened; it then appears like a small scaly boat very transparent, furrowed beneath, and finely denticulated on the margins. This lower jaw, in the act of depression, draws forwards two flat, irregular laminae of a scaly substance, a little bent at their posterior end, and larger at their origin than at the tips, denticulated on their anterior margin, and attached, one on one side, and the other on the opposite, to the most prominent part of the upper jaw; in the middle of the jaws is placed the tongue, which is pointed and free in its movements: the gill-covers, which are composed of several pieces, are very transparent at the hind part, but scaly, and of a bright silver-colour in front; the gill-membrane is also silvery, and has five rays; the breast is terminated below by a sharp carina, furnished with twenty-eight spines, disposed in two longitudinal ranges; the anal-fin is very long, and extends almost as far as the base of the tail-fin, which is of a forked shape; the dorsal-fin is placed on the tail, properly speaking, at about three quarters of the whole length of the animal, but it is extremely small. The colour is supposed to be of a bright silver, from the specimens preserved some time in spirits. It is a native of the American seas, and is common about the coasts of Cayenne, where it is ranked as a species of food.

ODONTAGOGOS, from *ὄδης*, a tooth, and *αγω*, to draw, in *Surgery*, an instrument for drawing teeth.

ODONTAGRA, from *ὄδης*, a tooth, and *αγρεω*, to seize, an instrument for drawing teeth. Also gouty pain in the teeth.

ODONTALGIA, from *ὄδης*, a tooth, and *αλγος*, pain, the tooth-ache. See TOOTH-ACHE.

ODONTIASIS, from *ὀδονιαω*, to cut the teeth; dentition.

ODONTICA, from *ὄδης*, remedies for the tooth-ache.

ODONTIRRHŒA, from *ὄδης* and *ῥεω*, to flow, bleeding from the socket, after the extraction of a tooth.

ODONTISME, in the *Music of the Ancients*, made, according to Jul. Pollux, a part of the Iambic and a third part of the Pythian nome.

ODONTITES, in *Botany*, so called from *ὄδης*, *ὀδοντος*, a tooth, a plant mentioned by Pliny as "a sort of hay, with small dense, or crowded, stems from the same root, which are jointed, triangular, and black. It has small leaves at the joints, but longer than those of *Polygonum*. Seeds axillary, resembling barley. Flower purple, small. It grows in meadows. A decoction of a handful of the stalks in wine of a rough flavour, held in the mouth, cures the tooth-ache." Botanists have presumed the above description to apply to the *Lychnis Flos Cuculi*, some latitude being allowed for what concerns the seeds. Linnæus has followed

Tabernæ-

Tabernæmontanus, in taking a species of *Euphrasia*, or *Bartsia* of *Fl. Brit.*, for the *Odontites*, and has retained this word as its specific name. Pliny's description, such as it is, agrees best with the above *Lychnis*, whose very remarkably toothed petals, might almost induce a supposition that the ancients were led in this instance, as in some others, to judge of the virtues of plants by their shape or structure. On this ground the *Orchis* roots have been thought aphrodisiac, and plants with oblong tuberous roots, good for the piles! We know not that any particle of truth has been stumbled upon by this sagacious mode of investigation; for where there may happen to be any such coincidence, the qualities of the plants were all, if we mistake not, previously known. The only famous writer on this subject, and one is surely enough, is Giovanni Baptista Porta, a Neapolitan, who in the latter part of the sixteenth century collected all that can be said about it, and certainly much more than is worth reading.

ODONTOGLYPHON, from *οδους*, and *γλυφω*, to *scrape*, in *Surgery*, an instrument for scraping the tartar off the teeth.

ODONTOIDES, in *Anatomy*, from *οδους*, *οδοντος*, a *tooth*, and *ειδος*, *form*, a name given to a process of the second vertebra of the neck. See **SPINE**.

ODONTOPHYIA, from *οδους* and *φωω*, to *grow*, in *Surgery*, the process by which the teeth are first formed: dentition.

ODONTOTRIMMA, from *οδους*, and *τριβω*, to *wear away*, a dentifrice, or application for cleaning the teeth.

ODOR, or **ODOUR**. See **SMELL**, and **NOSE**.

ODORAMENTUM, in *Pharmacy*, a medicine applied for the benefit of its smell, whether it be fetid, or agreeable.

Such are frequently used in hysseric and hypochondriac disorders; *e. gr.* assafoetida, camphor, &c.

ODORIFERÆ, in *Anatomy*, certain glands belonging to the male organs of generation. See **GENERATION**.

ODOROUS, or **ODORIFEROUS Things**, are such as exhale a brisk, agreeable smell, sensible at a distance.

Such are the jessamin, rose, tuberose, &c.

ODOVARA, in *Geography*, a sea-port town of Japan, in the island of Nippon; 120 miles E.N.E. of Meaco.

ODRAU, a town of Silesia, in the principality of Oppau, near the Oder; 32 miles W.S.W. of Teschen.

ODYSSEY, **ODYSSEA**, formed from *Οδυσσεια*, which signifies the fame with *Οδυσσευς*, *Ulysses*, an epic poem of Homer, wherein he relates the adventures that befel Ulysses in his return to Ithaca from the siege of Troy.

The design of the *Iliad*, F. Bossu observes, is to instruct the states of Greece, considered as united in one body, or as parts of the whole; and that of the *Odyssey*, to instruct those same states, considered in their private capacities.

A state consists of two parts: the head, which commands, is the first; and the members, that obey, the second. Now, instructions are required both for the one and the other; but it is possible to have them both conveyed under the same person.

The fable, then, of the *Odyssey* is as follows. A prince had been obliged to quit his country, and lead an army of his subjects upon a foreign expedition. After having gloriously executed this, he was upon his return home; but in spite of all his endeavours, was detained for several years by tempests, which threw him on several countries very different from one another as to manners, customs, polity, &c.

In the dangers he had to struggle with, his companions,

neglecting his advice, all perished through their own default. In the mean time, the great men of his country, abusing his absence, commit strange disorders in his palace, squander his treasure, lay snares for his son, and would force his wife to choose a husband among them; all this from an opinion, that he was entirely lost. But at length he returns; and having discovered himself to his son, and some others of his friends who had persisted in their allegiance, he becomes an eye-witness of the insolence of his courtiers; punishes them as they deserved; and restores that peace and tranquillity to his island, which had been banished during his absence.

The truth or model on which this fable is founded is, that a person's absence from home, so that he cannot have an eye to his affairs, occasions great disorders. Accordingly, the hero's absence is the principal and most essential part of the action, and takes up the greatest part of the poem.

This poem, Bossu adds, is more calculated for the people than the *Iliad* is, where the subjects suffer rather from the ill conduct of their princes than by their own faults. The great names of heroes, Ulysses, &c. do not here represent the poorest peasants less than princes, Cæsars, Alexanders, &c. The meanest people are as liable to ruin their estates and families by negligence, &c. as the greatest; and accordingly have as much need of Homer's lectures, and are as capable of profiting by them, as kings themselves.

Dr. Blair observes, that Longinus's criticism on the *Odyssey* is not unfounded; *viz.* that Homer may in this poem be compared to the setting sun, whose grandeur still remains, without the heat of his meridian beams. It wants the vigour and sublimity of the *Iliad*; and yet possesses so many beauties as justly to entitle it to high praise. It is a very amusing poem, and has much greater variety than the *Iliad*: its numerous stories are interesting, and its descriptions are beautiful. The same descriptive and dramatic genius, and the same facility of invention that appear in the *Iliad*, are manifest in the *Odyssey*. Although it descends from the dignity of gods and heroes, and warlike achievements, it nevertheless affords more pleasing pictures of ancient manners. Instead of the ferocity that reigns in the *Iliad*, the *Odyssey* presents us with the most amiable images of hospitality and humanity, entertains us with many wonderful adventures, and instructs us by a constant vein of morality and virtue, which runs through the poem. The *Odyssey*, however, has acknowledged defects. Many of its scenes fall below the majesty expected in an epic poem. The last 12 books, after Ulysses is landed in Ithaca, are, in several parts, tedious and languid; and though the discovery which Ulysses makes of himself to his nurse Euryclea, and his interview with Penelope before she knew him, in the 29th book, are tender and affecting, yet the poet does not seem happy in the anagnorisis or the discovery of Ulysses to Penelope; she is too cautious and distrustful, and we are disappointed of the surprise of joy, which we expected on that high occasion. Blair's Lect. vol. iii.

Gerard Croes, a Dutchman, in a book entitled *Ομηρος Ερμηνειος*, printed at Dort, in 1704, endeavours to prove, that the subject of Homer's two poems are taken from the Scriptures; that the action of the *Odyssey*, in particular, is nothing else but the adventures of the Israelites till the death of Moses; and that the *Odyssey* was composed before the *Iliad*, the subject whereof is the taking of Jericho. What fancies!

OE, in *Geography*, a small island of Denmark, N. of Laland. N. lat. 54° 58'. E. long. 11° 31'.

OEBSELD, a town of Westphalia, in the duchy of Magdeburg, on the Aller; 30 miles N.W. of Magdeburg.

ÆCOLAMPADIUS, called in his own country **HAUKSCHEIN, JOHN**, in *Biography*, one of the most learned German reformers in the 16th century, was born at Winsperg, a village in Franconia, in the year 1482. He was educated with a view to some learned profession, and was, when he had made considerable progress in grammar-learning, sent to the university of Heidelberg, where he was admitted to the degree of bachelor of philosophy when only fourteen years of age. As soon as he had taken the degree of M. A. his parents sent him to Bologna in Italy, with a view to his studying the law under the celebrated professors of jurisprudence, for whom that university was in high repute. After the end of six months he returned to Heidelberg, where he gave up all thoughts of studying the law as a profession, and applied himself to theology. His object was very different from the usual course pursued at that period; instead of aiming at the glory of excelling as a disputant in the public exercises of the university, his chief ambition was to store his mind with valuable and useful knowledge. One of his earliest steps in life was that of becoming tutor to the children of Philip, elector palatine, but Æcolampadius soon became disgusted with the manners of the court, relinquished his charge, and resumed with fresh ardour his theological studies. Having finished the usual academical studies, he quitted the university, and having received priest's orders, he entered upon a living at Winsperg, his native place, which had been endowed by his father. He had not officiated many weeks, when a diffidence in his own talents and qualifications led him to obtain leave to go to Stutgard for further improvement, where he attended the lectures of the learned Reuchlin, and perfected himself in the Greek and Hebrew languages. After this he returned to his benefice, and was distinguished by the great zeal and diligence with which he performed the several duties attached to the pastoral offices. During the residence of Æcolampadius at the university of Heidelberg, he had contracted an intimacy with Wolfgang Capito, who was now settled at Basil, and who obtained for his friend an invitation from the bishop of Basil to become a preacher in that city, and upon his arrival the prelate appointed him to the duties of the principal church. This was in the year 1515, and in the following year, when Æcolampadius was about thirty-four years of age, he took his degree of D. D. At this period Erasmus came to Basil to print his "*Annotations on the New Testament*," in which work he was assisted by Æcolampadius, who, in a short time, was invited to settle at Augsburg, where he preached in the great church, but finding a strong leaning towards the principles of the reformation, and not having courage to risk the consequences of such a change in his opinions, he entered the monastery of Alton, in the neighbourhood of Augsburg, to avoid being questioned on the subject. His friends greatly disapproved of this step, urged him to quit the monastery, and a regard to his private safety led him, at length, to comply with their solicitations. He had already given his private opinion in favour of the reformers, and had by his publications, particularly one on "*Confession*," given a strong handle to his enemies, of whom John Glasio, a Franciscan, and chaplain to Charles V., projected the design of taking him into custody, and holding him up as an example of signal punishment; he had, however, information of their design three days before it was to be put into execution, and by this he was enabled to retire out of the reach of his enemies. Having arrived in safety at Basil in 1522, he applied himself to the translation into Latin of St. Chrysostom's "*Commentary upon the Book of Genesis*." He was almost immediately appointed pro-

fessor of divinity by the senate, and in the following year was nominated minister of St. Martin's parish. These instances of preferment he refused to accept, but upon the express conditions that he should be at perfect liberty to teach whatever was clearly warranted, according to his own opinions, by the sacred Scriptures, and that he should not be obliged to retain such popish ceremonies as he considered to be useless. He now felt his mind at liberty, and openly preached against the leading tenets of the church of Rome, and was attended by very crowded auditories, who readily embraced the sentiments of the reformers. One of the first alterations which he introduced, under the sanction of public authority, was that of adopting the vulgar tongue at the baptism of infants. Afterwards the sacrifice of the mass was abolished, and the sacrament of the Lord's Supper was ordered to be administered in both kinds. Our reformer went still further, and held up to contempt, as superstitious ceremonies, the use of holy water, consecrated palms, tapers, &c. While the reformation was taking deep root at Basil, the dispute took place between Luther and Zuingle concerning the manner of Christ's presence in the Eucharist: in this controversy Æcolampadius embarked on the side of Zuingle, and in 1525 published a Latin treatise in defence of his opinion, entitled "*De vero intellectu verborum Domini, hoc est corpus meum*," which was pronounced by the learned Erasmus to be drawn up with so much skill and ingenuity, that even the elect were in danger of being seduced by it. In the year 1527, the reformers having been challenged by the Catholics to a public dispute at Baden, Æcolampadius entered the lists against Eckius, on the subjects of transubstantiation, &c. the reformer declaring that he would not submit to have the points at issue determined by any other rule of judgment than the word of God, and that none should be acknowledged as judges who would not decide according to the canon of Scripture. After the discussions were ended, the Swiss who were present formed themselves into two parties, of which one awarded the victory to Eckius, and the other to Æcolampadius; and even the deputies from Basil, where Æcolampadius was held in the highest estimation, were divided upon the subject. That the peace of the republic might not be disturbed by the contests of their respective partizans for superiority, the senate very judiciously and wisely passed a law, confirming both to the Catholics and the reformed the equal enjoyment of religious liberty. In 1528 our reformer married, and having completed the reformation of the church at Basil, he was called to Ulm, where, in conjunction with Martin Bucer, and others, he established the church of that city upon the same plan of doctrine and discipline which had been adopted by the reformed Swiss churches. In 1531, while he was diligently employed in the discharge of his office as minister of the church of Basil, and zealously serving the interests of the reformed religion by his advice and writings, he was attacked by the plague, to which he fell a sacrifice in the forty-ninth year of his age. To the excellence of his character, both Catholics and Protestants have borne ample testimony, and of his talents and learning his works afford sufficient evidence; these, which are numerous, consist of *Annotations and Commentaries on the books of Genesis, Job, and the Psalms*, and upon the prophecies, also on several books of the New Testament. He translated into Latin various pieces of the fathers; wrote numerous controversial treatises; and after his death an interesting volume of "*Letters*" between him and Zuingle was published at Basil in 1536. Moreri. Bayle. MS. Life of Luther.

ÆCONOMICS, ÆCONOMICA, that part of moral philosophy

osophy, which teaches how to manage the affairs of a family, or household.

ÆCONOMUS, οἰκονομος, a person appointed to direct and manage a vacant church revenue, or that of a hospital, or other community.

ÆCONOMUS was also anciently used for a protector, or advocate, who defended the rights and effects of churches, monasteries, &c.

ÆCONOMUS was also an appellation given to a church-office, who took care of the buildings and repairs of the church, and received and distributed alms according to the directions of the bishop.

In this sense it is that the sixth council appoints, that every church have its œconomus.

ÆCONOMY, οἰκονομία, the prudent conduct, or discrete and frugal management of a man's estate, or that of another.

ÆCONOMY, *Political*. See **POLITICAL Economy**.

ÆCONOMY, *Public*. See **PUBLIC POLICE**.

ÆCONOMY, *Animal*, the first branch of the theory of medicine; or that which explains the parts of the human body; their structure and use; the nature and causes of life and health, and the effects or phenomena arising from them.

This is otherwise called *physiology*; and its objects just enumerated are called the *naturals*, or *res secundum naturam*.

ÆCONOMY, *Legal*, or *Jewish*, or *Dispensation*, is the manner wherein God thought good to guide and govern his people under the ministry of Moses. See **JUDAISM**.

This included not only the political and ceremonial laws, but also the moral law, inasmuch as it pronounced a curse on all those who did not fulfil it perfectly.

ÆCONOMY, *Evangelical*, or *Christian*, or *Dispensation*, is used in opposition to the *legal*; and comprehends all that relates to the covenant of grace, which God has made with men by Jesus Christ.

ÆCONOMY of the *Parts of Plants*. See **PLANT**.

ÆCUMENICAL, formed of the Greek οἰκουμένης, of οἰκουμένη, the *habitable earth*, or the *whole earth*, signifies as much as *general* or *universal*.

In this sense we say an œcumenical council or synod; meaning one at which the whole Christian church assisted, or to which they were invited.

Du-Cange observes, that many of the patriarchs of Constantinople assumed to themselves the quality and denomination of œcumenical patriarchs; particularly John the Faster in 590, and Cyril, his successor. Gregory the Great of Rome was exceedingly enraged at it; pretending it was a title of pride, and the character of antichrist; as supposing the title of œcumenical to imply universal bishop, or bishop of all the world: whereas, in effect, it implied no more than the quality of chief of the Eastern church; in like manner as the first doctor of the church of Constantinople was called *doctor œcumenicus*.

The title œcumenical bishop was first offered to Leo I., but he refused it: nor did his successors accept of it for a long time. The fifth council of Constantinople gave it to John, patriarch of that city; though some of the Romanists pretend, that the emperor Phocas gave it, by way of preference, to the bishop of Rome. (See **POPE**.) But those of Constantinople have preserved it; and so late as the council of Basil, that patriarch used the title. But œcumenical here is only to be understood as of the extent of each patriarchate.

ÆCUMENIUS, in *Biography*, an ancient Greek commentator upon the Scriptures, who is supposed to have flourished in the 10th century, was bishop of Trica in Thes-

saly. He was author of Commentaries upon the Acts of the Apostles, and the fourteen epistles of St. Paul, and the seven Catholic epistles, which contain a concise and a perspicuous illustration of those parts of the New Testament. Besides his own remarks and notes, they consist of a compilation of the notes and observations of Chrysostom, Cyril of Alexandria, Gregory Nazianzen, Theodoret, and others. He is thought also to have written a commentary upon the four gospels, compiled from the writings of the ancient Greek fathers, which is not now extant. The works of Æcumenius were first published in Greek at Verona in 1532, and in Greek and Latin at Paris in 1631, in two volumes folio. To the second volume of the Paris edition is added the "Commentary" of Arethas upon the book of Revelation. Moreri. Lardner.

OEDEA, in *Geography*, a town of Persia, in Faristan; 50 miles W. of Yezd. N. lat. 52° 25'. E. long. 11° 10'.

ÆDEMA, from οἰδῶ, to swell. The term œdema, as a modern surgical writer has observed, was employed by some of the ancient authors in a sense synonymous with eminence, extuberance, or tumour; but, since the time of Galen, it has been more strictly confined to those tumefactions, which are derived from the effusion of a fluid into the cells of the reticular membrane of a particular part. The fluid is of the watery or serous kind. When the cellular membrane is extensively filled in this manner, the disease is not usually called *œdema*, but *anasarca*.

Mr. Pearson has distinguished six species of œdema; viz.

1. } **Ædema** { flaccidum.
2. } { durius.
3. **Ædema** symptomaticum, vel tumor œdematosus.
4. **Ædema** deuteropathicum.
5. **Ædema** cum erythemate.
6. **Ædema** purulentum.

Of the *Ædema Simplex Flaccidum*.—This form of the œdema, says Mr. Pearson, is characterised by a tumefaction of the integuments, commonly about the feet, ankles, and anterior surface of the tibia. There is no particular discolouration of the parts. It is unattended with pain; but there is usually a sense of weight and tightness, and the freedom of motion is more or less impaired. Firm pressure upon the tumefied part produces a little cavity, which is not very quickly effaced, and the feet are generally somewhat colder than natural. The œdema usually increases towards the evening, but, in consequence of rest and a horizontal position, it generally subsides during the night.

According to Mr. Pearson, the remote causes are of the following descriptions.

1. Compression of the larger veins, or of the trunks of the absorbent vessels.

Obesity. Gravid uterus. Tumours within the abdomen. Sitting long on a hard seat. Riding long in a carriage, or on horseback. Tight bandages. Unequal pressure from splints, &c.

2. Whatever diminishes the powers which propel the returning blood.

A sedentary life. Long exposure to cold, without exercise, and in persons of advanced age. Exposure to cold and damp. Old age in subjects who have led inactive lives.

3. Injurious effects produced on the stomach. Drinking excessively of diluting liquors, spirits, or fermented beverages. Intemperance in eating.

4. Profuse hemorrhages. Hypercatharsis.
5. Those diseases of the heart and lungs, which obstruct the due transmission of the blood through the pulmonary vessels.

6. Local

ŒDEMA.

6. Local injuries, as blows, sprains; also inflammation, or erysipelas of the lower extremities.

With regard to the prognosis, the danger, or unimportance of this species of œdema, must principally depend upon the difficulty, or ease, with which the remote cause may be obviated.

In the treatment of the œdema simplex flaccidum, the indications are, to remove, if possible, the remote cause; to alter that state of the system, by which the disease is supported; and to promote the absorption of the fluid distending the cellular membrane by means of purgatives and diuretic medicines. In the local treatment, the main objects are to facilitate the return of the blood by a horizontal posture; to support the parts, and promote absorption, by the application of a flannel bandage; and to strengthen the parts by friction, and the use of liniments. Bathing the parts in hot salt brine, or sea-water, and the use of a laced stocking, will sometimes both assist the cure, and prevent a relapse.

Œdema Simplex Durius.—Mr. Pearson observes, that this form of the disease appears in one, or both of the lower extremities; it is accompanied with pain, and some degree of lameness; but there is no discolouration of the skin, nor preternatural increase of temperature. The swelling is nearly uniform, and extends from a little below the knee to the ankle, seldom affecting the foot. The diseased part is firmer than in the œdema simplex flaccidum, and yields very little to pressure.

Mr. Pearson conceives, that this disease is connected with a morbid state of the deeply-seated absorbents of the leg. It is said to occur more frequently in women than men, and as often in young adults as in older persons.

The remote causes are not always manifest. Amenorrhœa in plethoric habits; inactivity in corpulent persons; and standing a long while every day; are mentioned as circumstances by which this species of œdema has been induced.

The treatment advised by the preceding gentleman, consists in purging the patient every four or five days; giving small doses of calomel, with alkaline salt, on the intermediate days, enjoining rest and a recumbent posture, until the pain abates; and applying the vapour of spirit of wine and volatile alkali. When the hardness and extraordinary tenderness of the absorbent vessels are diminished, he recommends the use of the linimentum ammoniæ, and the employment of a flannel bandage for a few weeks after the cure.

Œdema Symptomaticum.—This is stated to be not different from the œdema simplex flaccidum, and it is arranged under a separate head, because it occurs as a sign of some other disease, without absolutely constituting a part of it. Amongst other cases, the following are some, which this kind of œdema indicates the existence of; simple fracture; fracture of the cranium; empyema; blood effused in natural cavities; deeply-seated abscesses; gangrene; diseases of the periosteum and bone; general debility, &c.

The cure of this complaint evidently depends upon the removal of the cause.

Œdema Deutero-pathicum seu Puerperarum.—This form of œdema mostly occurs about twelve or fifteen days after parturition; but it has sometimes come on as early as the following day. In other instances, however, three or four weeks have elapsed before the attack. It usually commences (says Mr. Pearson) with pain about the calf of the leg, succeeded by tumefaction in the labium pudendi and groin, which gradually descends down the thigh, leg, and foot, so that, in the course of two or three days, the whole of the lower extremity acquires a very considerable increase of bulk. The limb is painful, preternaturally warm, and

admits of no motion without great uneasiness being excited; but the colour of the skin is either unaltered, or whiter than natural. The integuments are firm, elastic, and do not yield to pressure, as in the œdema simplex flaccidum. No water is usually discharged on scarifying the part, nor is the swelling at all reduced by a horizontal position.

The disease never suppurates, nor does it leave any permanent induration, or lameness, although, in some cases, several weeks elapse before the patient recovers entirely the use of the limb.

The remote causes of this species of œdema do not appear to be understood with any degree of certainty.

The symptomatic inflammation may be relieved by such medicines as promote a diaphoresis; James's powder; saline draught with volatile alkali; liquor ammoniæ acetatis; small doses of the pulvis ipecacuanhæ compositus; camphor with opium, &c.

When the violence of the first symptoms has subsided, Mr. Pearson advises the free exhibition of purgatives, especially such as are combined with calomel and alkaline salt, and they should be repeated as frequently as the strength of the system will permit.

On the intermediate days, when the purgatives are not exhibited, Mr. Pearson recommends bark, calcarilla, myrrh, sulphuric acid, and similar tonics.

With respect to the local treatment, when the pain is very severe, the same gentleman thinks the application of leeches to the upper part of the thigh beneficial.

Anodyne fomentations; camphorated oil, with tincture of opium; and other liniments, are mentioned as useful; and a flannel bandage is to be applied as soon as the limb will bear it.

Other serviceable means are small blistering plasters; moderate exercise; and friction.

Œdema cum Erythemate.—This species of œdema is described by Mr. Pearson as coming on suddenly; the patient complains of shivering, pain in the loins, nausea, head-ache, &c. These febrile symptoms seldom continue with violence more than twelve hours; but when they remit, a sense of tingling is experienced in the foot and calf of the leg, extending to the groin. The whole of the lower extremity swells, becomes painful, and is almost universally red; the skin is very tender, and all motion gives great uneasiness. The absorbent glands in the groin and upper part of the thigh also become considerably enlarged. The redness and swelling commonly begin to subside in three or four days, the leg and foot remaining in a very œdematous state.

This disease sometimes attacks young women, whose menses are not regular; but females, not at all affected with chlorosis, may have the complaint. Men are also occasionally the subjects of the disorder. The persons most liable to be attacked, are those who are corpulent; whose fibres are flaccid; whose occupations require much standing; more especially when those persons drink immoderately of spirituous liquors.

This disease is treated in the same manner as the œdema puerperarum.

Œdema Purulentum.—This form of œdema is less frequent than any of the former kinds, though as severe as the worst of them. It usually begins with shivering, increased heat, accelerated pulse, debility, and other febrile symptoms. Soon after this attack, the patient complains of pain in his groin; the inguinal glands are enlarged and tender; and the thigh is hot, but not at all swelled or discoloured. In a few days the knee inflames, while the leg and foot become affected with the œdema simplex flaccidum. In about ten or fourteen days from the commencement of the disease,

two or three indurated parts, of small dimensions, may be discovered in the ham and inner part of the thigh, and now the whole limb is in general highly œdematous. When one of the indurations bursts, a large quantity of pus is discharged.

According to Mr. Pearson, the œdema purulentum comes on without any evident cause. This gentleman has hitherto seen it only in young persons, who were under the age of twenty years, and of a scrofulous habit.

During the first stage of this complaint, diaphoretics, combined with opium, are recommended. As soon as suppuration has occurred, Peruvian bark must be given with opium. This medicine must be continued after the abscess has burst, and be assisted with a generous diet, and country or sea-air. The sulphuric acid is also an eligible remedy.

When the abscess has burst, Mr. Pearson recommends applying dry lint and common digestive, care being taken to wash the part, at each time of dressing it, with Bates's camphorated lotion. A roller will also do good.

ÆDEMOSARCA, from *οἰδημα* and *σαρξ*, *flesh*, an œdematous swelling, attended with a firm, fleshy feel.

ÆDERA, in *Botany*, named by Linnæus in honour of George Christiaan Oeder, once professor of Botany at Copenhagen, to whom the *Flora Danica* was, at its beginning, entrusted. Having completed three volumes, containing 540 plates, he resigned the botanical chair for another appointment under the Danish government, when the above work was assigned to the care of Muller, and afterwards to Vahl. The other botanical publications of this gentleman are, *Elementa Botanica*, published at Copenhagen, in two parts, in 1764 and 1766; *Nomenclator Botanicus*, printed in 1769; and *Enumeratio Plantarum Floræ Danicæ*, printed in 1770. Oeder was born at Anspach in 1728, and died at the age of 63 years. Linn. Mant. 159. Schreb. 590. Willd. Sp. Pl. v. 3. 2392. Mart. Mill. Dict. v. 3. Juss. 189. Lamarck Illustr. t. 720. Gært. t. 172.—Class and order, *Syngenesia Polygamia Segregata*. Nat. Ord. *Compositæ Oppositifolia*, Linn. *Corymbifera*, Juss.

Gen. Ch. *Common calyx* many-flowered, squarrose, of several, lanceolate leaves, longer than the flower; the lower ones larger; containing numerous *partial calyxes* of many, chaffy, lanceolate leaves, the length of the florets. *Cor.* common radiated, of many partial flowers which are also radiated though placed in the common disk. Florets of each partial disk perfect, funnel-shaped, five-cleft, erect: those of the radius female, ligulate, lanceolate, the length of the common calyx. *Stam.* (in the perfect florets) Filaments five, very short; anthers in a cylindrical tube. *Pist.* (in the perfect florets) Germen oblong; style thread-shaped; stigmas two, thread-shaped, obtuse; in the female florets the stigma is longer. *Peric.* none, except the unchanged calyx. *Seeds* oblong, crowned with many scales; pointed and shorter in the perfect florets. *Recept.* Common and partial, scaly; the scales of the latter linear, deciduous.

Eff. Ch. *Partial calyx* many-flowered. Florets tubular, perfect, with one or two female, ligulate. Receptacle chaffy. Down of several scales.

1. *O. prolifera*. Linn. Mant. 291. Suppl. 391. Thunb. Prodr. 169. (Bupthalmum capense; Linn. Sp. Pl. 1274. Amœn. Acad. v. 6. 104. Berg. Cap. 297.)—Leaves opposite, lanceolate, fringed, smooth on both sides.—Found in sandy situations at the Cape of Good Hope. *Stem* shrubby, compound, with ascending *branches*, covered at the lower part with scars from fallen *leaves*. *Leaves* opposite sessile, narrow, acute, channelled, chiefly abounding towards the end of the branches, green. *Flowers* terminal, solitary,

yellow. *Seeds* compressed, slightly furrowed, smooth, light brown.

2. *O. aliena*. Linn. Suppl. 390. Jacq. Hort. Schoenb. v. 2. 14. t. 154. Frag. Bot. 5. t. 2. f. 9. (*Arnica inuloides*; Vahl. Symb. 91. Banks. MSS.)—Leaves linear, downy beneath. A native also of the Cape, where it flowers in July and August. *Stems* two or three feet high, very leafy, round, glaucous, branched. *Leaves* numerous but scattered, nearly sessile, acute, much spreading, an inch and half long, resembling those of rosemary. *Flowers* almost sessile, terminal, solitary, erect, of a very showy yellow, as large as those of the Marigold. *Seeds* white; their down straw-coloured. The whole *shrub* is scentless, and has rather a bitter flavour.

Linnæus remarked that this plant might possibly belong to some other genus, for that it had the appearance of *Stachelina* or *Gnaphalium* with the flowers of *Calendula*. Vahl makes it an *Arnica*, under which name it appears in the herbarium of sir Joseph Banks.

3. *O. hirta*. Thunb. Prodr. 169. Willd. n. 3.—Leaves ovate, entire, hairy.—This is also a Cape plant; but we know not that it is any where described or even noticed except by the authors above quoted.

OEDEAU, or **ODERN**, in *Geography*, a town of Saxony, in the circle of Erzgebirg; 9 miles E.N.E. of Chemnitz. N. lat. 50° 48'. E. long. 13° 7'.

ÆDICNEMUS, in *Ornithology*, the name of a bird called also *charadrius* by Gesner and Aldrovand, and in English the *Stone CURLEW*; which see.

OE DJONG PACA, in *Geography*, a town on the N. coast of the island of Java.

ÆDIPUS, in *Biography*, one of the semi-fabulous heroes of Greece, whose tragical adventures have been a favourite subject of the Grecian poets and dramatists; was the son of Laius, king of Thebes, in Bœotia, and Jocasta, the daughter of Creon. The oracle of Apollo, according to the ancient tradition, having foretold that the son of Laius would be his father's murderer, he was given immediately after his birth to a shepherd, in order to be exposed to wild beasts. In this situation he was found by the herdsman of Polybius, king of Corinth, who brought him to his master: that prince educated him as his own son, and gave him the name of Ædipus, which referred to the swelling of his feet, occasioned by their having been bored in order to hang him on the branch of a tree. When he came to adult age, he discovered that he was not the son of his reputed father, and went to the oracle of Delphos to enquire after his real parents. By the way he met with Laius at Phocis, and a quarrel arising between their attendants, in which the masters took part, he had the misfortune to kill his unknown father. Another account relates that their encounter was owing to a sedition in Phocis, in which Ædipus took a part against his father. He proceeded to Thebes, where his success in expounding the enigma of the sphinx, who is represented as the monster that laid waste the country, raised him to the throne and to the bed of the widow, his own mother Jocasta. By her he had two sons, Eteocles and Polynices. A train of circumstances at length disclosed to him the parricide and incest of which he had been unknowingly guilty. Struck with horror at the unintentional criminality in which he had been involved, he tore out his eyes, as unworthy to behold the light, and taking sanctuary in the grove of the furies in Attica, there ended his miserable life. Jocasta also put an end to her life, and to complete the tragedy, their sons were distinguished by the inveteracy of their mutual hatred. The death of Ædipus is placed by chronologists about the year 1228. B.C. Univer. Hist.

OEDMANNIA, in *Botany*, so called by Thunberg, in honour

honour of his countryman, the Rev. Samuel Oedmann, author of various treatises relating to natural history, published in Swedish, in the Stockholm Transactions. Thunb. Prodr. præf. n. 46. Stockh. Transf. for 1800. 278. Willd. Sp. Pl. v. 3. 925. —Class and order, *Diadelphia Decandria*. Nat. Ord. *Papilionaceæ*, Linn. *Leguminosæ*, Juss.

Gen. Ch. Cal. Perianth inferior, of one leaf, bell-shaped, tapering at the base, smooth and even, two-lipped. Upper lip largest, deeply cloven; lower simple, awl-shaped, taper-pointed. Cor. papilionaceous, twice the length of the calyx. Standard large, stalked, elliptical; heart-shaped at the base; notched, with a small point, at the tip; concave, smooth. Wings stalked, half-heart-shaped, oblong, obtuse, undivided, half the breadth of the standard, but of the same length. Keel of two stalked, half-heart-shaped, acute, boat-like petals, the length of the wings. Stam. Filaments ten, all united into a compressed tube, separate and curved at the top, the length of the corolla; anthers oblong. Pist. Germin superior, linear-lanceolate; style thread-shaped, curved, rather longer than the stamens; stigma simple. Peric. Legume elliptical, smooth. Seeds . . .

Ess. Ch. Calyx two-lipped; upper lip cloven; lower bristle-shaped. Corolla papilionaceous; petals stalked. Legume elliptical.

1. *O. lancea*. Thunb. Prodr. 122. Stockh. Transf. for 1800. 281. t. 4.—Native of the Cape of Good Hope. The stem is about a foot high, rather herbaceous than shrubby, ascending, simple, round, brown, leafy, quite smooth. Leaves alternate, sessile, lanceolate, entire, smooth, an inch and half long, numerous, rather crowded, and nearly erect; their base tapering; their point acute. Flowers at the top of the stem, axillary, solitary, stalked, scarcely projecting beyond the leaves. Of their colour nothing is said; their size is about that of a Lupine. This genus ranges next after *Borbonia*, with which it altogether accords in habit. The character of the calyx is very peculiar. Thunberg makes the legume elliptical, in his full description of the genus, but lanceolate in his short essential character. The figure of the germin renders the former most probable. We have seen no specimen, but the plant is very likely to be confounded in our collections amongst *Borbonia* or *Liparia*.

OEGWA, or AGUA, in *Geography*, a town of Africa, on the Gold Coast, situated, between Elmina and Cape Coast, on the brow of an eminence, and defended by rocks, against which the waves beat with the utmost violence, and with a noise that is heard at a great distance; or, as others say, entirely commanded by the cannon of Elmina. Oegwa is said by Barbot to contain about 500 houses, disjoined by narrow crooked streets; and from the sea to have the appearance of an amphitheatre. Des Marchais reduces the number of houses to 200, in the centre of which stands a large square building, the repository of their gold dust and other commodities. The houses are built of earth and clay, but convenient and well furnished. No part of the coast is better provided with articles of subsistence, which are brought from the adjacent cantons, and sold in public markets. Every thing is bought and sold with gold dust, which is the standard of all other commodities, and brought hither in great abundance from all quarters of Fetu, Abrambo, Assiento, and Mandingo. Next to gold, the chief commerce of the place consists in the sale of fish, of which great quantities are caught on the coast; in which operation the inhabitants are very skilful. The natives, though brave and warlike, are very industrious in time of peace, employing their whole time in catching fish, or cultivating the fruits of the earth. Every day in the week, except Wednesday, which is sacred to the fetiche, they em-

ploy in their several occupations. Their canoes weather storms which would endanger the largest shipping; and the Negroes are dextrous in availing themselves of those seasons, which oblige others to discontinue their labours, by throwing their fishing-lines with the same success in tempestuous as in calm weather.

OEI, a river of China, which discharges itself into the grand canal, in the province of Chang-tong, at Li-tchin, or Lin-tcin.—Also, a city of China, of the second rank, in the province of Chen-si. N. lat. 33° 48'. E. long. 105° 39'.

OELAMPANG, a town on the E. coast of the island of Java. S. lat. 8°.

OELAND, an island in the Baltic, belonging to Sweden, opposite to Calmar, about 70 miles long and 6 broad. In the north part are several fine forests and stone quarries; but in the south part the ground is more level, and adapted both to tillage and pasture. This island affords plenty of butter, honey, wax, and nuts. The horses, called "klappers," are small, but strong and mettlesome. The king's forest extends over the whole island; and here are numbers of various kinds of deer, with hares and wild boars. Both the N. and S. parts of the island abound in alum-mines. The Oeland sand-stone, or free-stone, which is harder than that of Gothland, is supplied by this island; and also black marble or touch-stone. The sea-weed is used here for manure. The inhabitants, amounting to the number of 7000 at least, are employed in agriculture, working in the quarries, cutting of stones, burning of lime, fishing, and navigation. The sailors belonging to the crown are generally quartered in this island. The four provostships into which Oeland is divided are in the diocese of Calmar. N. lat. 56° 45'. E. long. 16° 20'.—Also, an island of Denmark, in the Lymfjord gulf, about five miles long, and from 1 to 2½ broad; containing three or four villages. N. lat. 57° 4'. E. long. 9° 36'.

OELETS. See KALMUCKS.

OELLINGEN, or ELLINGEN, a town of Germany, in the circle of Franconia, which has a fine citadel belonging to the Teutonic knights, and is the usual residence of the provincial commander; 20 miles S.E. of Anspach. N. lat. 48° 59'. E. long. 10° 55'.

OELPE, a town of the duchy of Stüria; 4 miles S. of Wipperfurth.

OELS, a city of Silesia, and capital of a principality of the same name. This town contains a residentiary palace of the prince, two Lutheran churches, a free-school, and a Popish church. It has suffered much at different times by fire. The principality is bounded N. and E. by Poland, S. by the principalities of Oppeln, Brieg, and Breslau, and W. by the principality of Wohlau. The soil is sandy, and not very fertile; 14 miles E.N.E. of Breslau. N. lat. 51° 10'. E. long. 17° 28'.

OELSEN, a town of Saxony, in the margraviate of Meissen; 6 miles N.E. of Launstein.

OELSNITZ, a town of Saxony, in the Vogtland; 70 miles S.W. of Dresden. N. lat. 50° 19'. E. long. 12° 15'.

CENANTHE, in *Botany*, a name adopted by old authors, which occurs in Theophrastus and Dioscorides, signifying the flower of the vine, derived from *cen*, the vine, and *anthos*, a flower. Tournefort applied it to the present genus, because, he says, it blossoms at the same time with the vine, and because its flowers reminded him of the smell and colour of the flowers of that plant.—Tourn. Inst. 312. t. 166. Linn. Gen. 140. Schreb. 189. Willd. Sp. Pl. v. 1. 1440. Mart. Mill. Dict. v. 3. Sm. Fl. Brit. 317. Ait. Hort. Kew. ed. 2. v. 2. 147. Juss. Gen. 221. Lamarck Dict.

v. 4. 526. Illustr. t. 203. Gærtn. t. 22.—Class and order, *Pentandria Digynia*. Nat. Ord. *Umbellatæ*.

Gen. Ch. *General umbel* of not many rays; *partial* dense, of numerous, very short, or no rays. *General involucre* simple, shorter than the umbel; *partial* small, both of many leaves. *Perianth* of five, awl-shaped, permanent teeth. *Cor. Universal* unequal, radiated. Florets of the disk perfect, with five, inflexed, heart-shaped, nearly equal petals; of the radius, male, with five very large, unequal, inflexed, cloven petals. *Stam.* Filaments five, simple; anthers roundish. *Pist.* Germen inferior, oblong, furrowed; styles two, awl-shaped, permanent; stigmas obtuse. *Peric.* none, except the nearly ovate fruit, divisible into two parts, and crowned with the perianth and styles. *Seeds* two, nearly ovate, convex on one side and striated, flat on the other, toothed at the top.

Obs. The perianth of *Cenanthe* is more conspicuous than in any other umbelliferous genus.

Eff. Ch. Flowers irregular: those of the radius sessile and abortive. Fruit crowned with the calyx and styles; its bark corky.

1. *O. ffusulosa*. Common Water Dropwort. Linn. Sp. Pl. 365. Engl. Bot. t. 363. Fl. Dan. t. 846.—Root sending forth runners. Stem-leaves pinnated, cylindrical, tubular. General involucre, for the most part, wanting.—Very common in wet ditches, pools, and marshes, flowering in July and August.—Root perennial, tuberous, creeping. Stems erect, two or three feet high, branched, round, hollow like a pipe, inflated, furrowed, smooth, leafy, glaucous. Radical-leaves immersed, bipinnate; leaflets flat, wedge-shaped, and lobed; stem-leaves alternate, pinnate; leaflets and stalks cylindrical and hollow. General umbel composed of from three to eight partial umbels, each furnished with numerous, flesh-coloured flowers. Calyx-teeth sharp and always spreading.

2. *O. crocata*. Hemlock Water Dropwort. Linn. Sp. Pl. 365. Engl. Bot. t. 2313. Jacq. Hort. Vind. v. 3. 32. t. 55.—All the leaflets wedge-shaped, cut, nearly equal.—“Happily (says Dr. Smith) this very noxious plant is of rare occurrence.” It grows in moist places about the brinks of great rivers, as the Thames and others, flowering in July.—Root perennial, composed of numerous, ovate, fleshy knobs. Stems erect, from two to five feet high, branched, somewhat forked, leafy, round, furrowed. Leaves dark-green, bipinnate; leaflets all nearly similar, mostly opposite, sessile, veiny, smooth. Umbels terminal, large, convex, of many general and partial rays. Flowers white, often with purplish styles and anthers, slightly radiant. Calyx incurved.

The whole herb abounds with a fetid, yellow juice, which is extremely virulent and poisonous, especially about the root. Ehret mentions that he was affected with a giddiness only from drawing the plant. Sir Thomas Frankland informed Dr. Smith that, to his knowledge, brood mares have died in consequence of eating the root.

3. *O. prolifera*. Proliferous Water Dropwort. Linn. Sp. Pl. 365. Jacq. Hort. Vind. v. 3. 35. t. 62.—The marginal, partial umbels male, on elongated, branched stalks.—Native of Italy and Sicily. It flowers in June and July.—Root perennial, tuberous. Stem herbaceous, nearly two feet in height, upright, slightly branched, green, purplish at the base, angular and striated. Leaves triply pinnate; leaflets blunt, subovate or roundish. General umbel consisting of from five to eight convex rays of white or yellowish flowers, the central partial umbel very dense, and much larger than the rest. Fruit a compact, hard, hemispherical head.

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4. *O. globulosa*. Globular-headed Water Dropwort. Linn. Sp. Pl. 365. Gouan. Illustr. 18. t. 9.—Fruit globular.—Native of Portugal, and flowering in June and July.—Root perennial, branched. Stem a foot high or more, angulated and generally purplish at the base. Radical-leaves ternate or quinate, some of the leaflets lanceolate, some wedge-shaped, veiny, smooth. Stem-leaves pinnate; leaflets simple, narrow, long. Umbel of three or four unequal rays, each composed of twelve or fifteen flowers. Fruit globular, smooth, larger than that of co-riander.—Gouan observes that this species has a great resemblance to *O. pimpinelloides*, but is easily distinguished by not having a lanceolate, triangular outline to its leaves, nor so branched a stem.

5. *O. peucedanifolia*. Sulphur-wort Water Dropwort. Pollich. Palat. v. 1. 289. t. 3. Engl. Bot. t. 348.—Leaflets all linear. General involucre none. Knobs of the root sessile, elliptical. Found in fresh inland waters, but by no means a common plant.—It was sent from the neighbourhood of Bedford, and Bury, to Dr. Smith, who observes that no other British author except Dr. Sibthorp has noticed this species, probably from having confounded it with the following *O. pimpinelloides*. The flowers appear in June.—Root perennial, composed of elliptical, sessile tubers, which are much crowded together. Stem thickish, rather firm, erect, angular, round, striated, leafy, not much branched. Radical-leaves bipinnate; stem-leaves pinnate: all the leaflets linear, acute. General umbel consisting of five or seven rays, of dense, yellow or often reddish, flowers.

6. *O. pimpinelloides*. Parsley Water Dropwort. Linn. Sp. Pl. 366. Engl. Bot. t. 347.—Leaflets of the radical leaves wedge-shaped, cloven; those on the stem entire, linear, very long. General involucre of several linear leaves.—Native of salt marshes in various parts of Great Britain. It flowers in July.—Root perennial, composed of many spindle-shaped, slender, fleshy tubers intermixed with fibres. Stem erect, or ascending, nearly cylindrical, striated, smooth leafy. Radical-leaves bipinnate; those of the stem pinnate. General umbel terminal, composed of ten or twelve nearly equal rays. Flowers white, reddish at the back.—This species is completely a maritime one, and though no noxious properties are attributed to it, yet the very dangerous *O. crocata* cannot fail of making the whole genus suspected of being poisonous.

Thunberg in his Prodrum, 49, and 50, enumerates five additional species of *Cenanthe*, natives of the Cape of Good Hope.—They are *O. inebrians*, *tenuifolia*, *ferrulacea*, *interrupta*, and *exaltata*. These are all adopted by Willdenow.

CENANTHE, in Ornithology, a name given to several species of *Motacilla*, as the *flapazina*, *enanthe*, *rubetra*, *rubicola*, *trochilus*; which see. See also FRINGILLA *Petronia*.

CENARIA, a name given by the ancients to ashes prepared from the leaves, tendrils, and young stalks of the vine. They were accounted highly diuretic.

CENAS, in Ornithology, the name used by authors for the stock-dove, or wood-pigeon, called also by some *vinago*, somewhat larger than the common pigeon, but of the same shape and general colour. Its neck is of a fine changeable hue, as differently opposed to the light; and its breast, shoulders, and wings, are of a fine purplish hue, or red wine colour, from whence it has its name *vinago*. Its legs are red, and feathered a little below the joint. See COLUMBA *Enas* and *Migratoria*.

CENELÆUM, *οινελαειον*, formed of *οινος*, wine, and *ελαιον*, oil, in Pharmacy, a mixture of wine and oil; usually of thick black wine, and oil of roses.

In fractures with wounds, where the bone is not bare, U u Scultetus

Scultetus orders that the compresses, to make them stick, be drenched with œnelæum, to soothe the pain, and prevent an inflammation; and the bandage to be every day moistened with the same, till the inflammation be out of all danger.

ENISTERIA, in *Antiquity*, sacrifices held by the youth of Athens, before the first time of cutting the hair, and shaving the beard.

The etymology of the word, which comes from οἶνος, *wine*, shews, that the matter here offered was wine.

These sacrifices were offered to Hercules; and the quantity of what was offered was regulated by law.

ENO GALA, a word used by Hippocrates, and other of the Greek authors, to express a mixture of milk and wine for immediate drinking. Others have used it to express wine alone heated, so as to be just as warm as new milk.

ENOMANTIA, οἰνομαντεία, in *Antiquity*, a species of divination by wine, which is done by making conjectures from the colour, motion, noise, and other accidents of the wine of libations.

ENOMAUUS, in *Biography*, a Greek philosopher, who flourished in the second century, usually classed with the Cynics, was a native of Gadara, and flourished in the reign of the emperor Adrian. He wrote a treatise to expose the frauds and impostures of oracles, which was very ably executed, and with a degree of freedom which would not have been permitted in a Christian. He wrote another treatise, to censure the degeneracy of the latter Cynics; and Suidas ascribes to him certain treatises on government, and the philosophy of Homer, as well as the biographies of Crates, Diogenes, and other Cynic philosophers. None of his pieces have reached our times; but fragments of his work against oracles are preserved in the fifth and sixth books of Eusebius's "Evangelical Preparation." Moreri. Brucker by Enfield.

ENOPTÆ, a kind of officers, or censors, at Athens, who attended at their feasts, regulated the number of cups each was to drink, and took care that none drank too much or too little.

Those who would not be kept within the bounds of temperance, were presented by the œnoptæ to the areopagus. The œnoptæ were also called *eyes*, *oculi*.

ENOTHERA, in *Botany*, from οἶνος, *wine*, and ἐνερῶς, a *searching* or *catching*; a name, as we learn from Theophrastus, bestowed upon the plant on account of its root having caught the perfume of wine from being dried; but whether our *Enothera* be the same as that of Theophrastus we are at a loss to determine. Linn. Gen. 187. Schreb. 250. Willd. Sp. Pl. v. 2. 306. Mart. Mill. Dict. v. 3. Ait. Hort. Kew. ed. 2. v. 2. 341. Michaux. Boreal-Amer. v. 1. 224. Juss. 319. Lamarck Dict. v. 4. 550. Illustr. t. 279. (Onagra; Tournef. t. 156. Gærtn. t. 32.)—Class and order, *Obandria Monogynia*. Nat. Ord. *Calycanthemæ*, Linn. *Onagræ*, Juss.

Gen. Ch. *Cal.* Perianth superior, of one leaf, deciduous; tube cylindrical, erect, long; limb cloven into four, oblong, acute, deflexed segments. *Cor.* Petals four, obcordate, flat, placed at the divisions of the calyx, and as long as its segments. *Stam.* Filaments eight, awl-shaped, incurved, inserted into the throat of the calyx, shorter than the corolla; anthers oblong, incumbent. *Pist.* Germen inferior, cylindrical; style thread-shaped, the length of the stamens; stigma four-cleft, thick, obtuse, reflexed. *Peric.* Capsule cylindrical, square, of four cells, and four valves; partitions contrary. *Seeds* numerous, angular, naked.

Recept. columnar, unconnected, square, its angles meeting the edges of the partition.

Eff. Ch. Calyx four-cleft. Petals four. Capsule of four cells and four valves, cylindrical, inferior. Seeds naked.

This is an ornamental genus of herbaceous plants, chiefly American. In the 14th edition of *Système Vegetabilium* are enumerated ten species. Willdenow has fifteen, all of which may be found in the second edition of the *Hortus Keewensis*. We shall first give a few examples of these species.

O. biennis. Common Evening Primrose. Linn. Sp. Pl. 492. Engl. Bot. t. 1534. Fl. Dan. t. 446.—Leaves ovato-lanceolate, flat. Stem rough, somewhat hairy. Stamens regular. Petals undivided.—This is the only British species of *Enothera*, nor was it till very lately admitted as such. It grows on the extensive and dreary sand-banks to the north of Liverpool, flowering from July to September. It was originally discovered in America, but is now naturalized almost throughout Europe, and is frequent in gardens. Stem two or three feet high, sometimes branched, leafy, angular, rough with minute tubercles, hairy. Leaves alternate, ovate or lanceolate, toothed, downy; the lowest stalked, longer and somewhat waved. Flowers sessile in the bosoms of the upper leaves, so as to form a large spike. They are of a fine pale yellow colour, expand in the evening, and are delicately fragrant. The unfolding of the petals is so sudden, that a sort of explosion has been heard, by some curious observers, in the separation of the calyx-leaves.

O. fruticosa. Shubby *Enothera*. Linn. Sp. Pl. 492. Curt. Mag. t. 332.—Leaves lanceolate, somewhat toothed, acute. Capsules stalked, oblong-club-shaped, angular.—Native of Virginia; flowering from June to August. Root perennial. Stem herbaceous, not really shrubby, three or four feet high, round, hairy, pale red. Leaves green on the upper side, glaucous beneath, tinged with red at their tips and edges. Flowers in clusters, very large and showy, bright yellow, expanding in the evening, but unlike most of the genus remaining open during the greater part of the following day. Curtis says "the flower-buds, the germen and the stalk are enlivened by a richness of colour, which contributes to render the species one of the most ornamental and desirable of the tribe."

O. pumila. Dwarf *Enothera*. Linn. Sp. Pl. 493. Curt. Mag. t. 355.—Leaves lanceolate, entire, obtuse. Capsules on short stalks, elliptically obovate, angular.—Native of North America. It flowers from May to September. Root perennial. Stems ascending, scarcely a foot in height, smooth, reddish. Leaves sessile, light green, tinged with red at their points, rather blunt. Flowers sessile, spiced, small, yellow, and like the last they remain expanded in the day as well as in the evening. This is by far smaller than any other Linnæan species of *Enothera*.

O. rosea. Rose-flowered *Enothera*. Willd. n. 14. Curt. Mag. t. 347.—Leaves ovate, toothed; lower ones lyrate. Capsules club-shaped.—Native of Peru, and introduced into Europe in 1783. It flowers throughout the greater part of the summer. Root scarcely perennial. Stem about a foot in height, upright, smooth. Leaves nearly sessile, pointed and tipped with red. Flowers solitary, on long stalks, of a bright rose colour.

O. purpurea. Purple-flowered *Enothera*. Willd. n. 15. Curt. Mag. t. 352.—Leaves glaucous, smooth, lanceolate, entire, attenuated at each end, obtuse. Capsules sessile, ovate, angular.—Native of North America, where it was discovered by A. Menzies, esq. in 1794. A very ornamental species, and chiefly distinguished by the soft and glaucous appearance of its foliage, the purple hue of its blossoms.

blossoms, and the dark colour of its stigma. *Root* annual. *Stem* about two feet high, rather waved, smooth. *Flowers* sessile, spiked, very abundant, of a rich lilac or purple colour.

The other species of *Willdenow* and the *Hortus Kewensis* are *O. grandiflora*, *parviflora*, *muricata*, *longiflora*, *mollissima*, *undulata*, *nocturna*, *villosa*, *sinuata*, and *tetraptera*.

Michaux divides the genus into two sections; the first with *elongated fruit*; and the second with *short acutely quadrangular fruit*. In his second section we find the following species, which are met with in no other author. *O. glauca*, *hybrida*, *linearis*, *chrysantha*, and *puffula*.

The following South American species of this beautiful genus are described and figured in the fourth volume of *Cavanille's Icones*.

O. tenella. Cavan. Ic. t. 396. f. 2.—Stem herbaceous, erect. Leaves ovate-oblong. Four of the anthers nearly sessile.—Found near Chili, flowering in November. *Stem* six or eight inches high, generally simple. *Leaves* alternate, the lower ones smaller, rather hairy. *Flowers* axillary, solitary, sessile, violet-coloured.

O. tenuifolia. Cavan. Ic. t. 397.—Leaves linear, very narrow, elongated. Petals notched.—Native country, and time of flowering, as in the last. *Stems* round, a foot and half high. *Branches* numerous, slender, somewhat hairy, smooth when old. *Leaves* alternate, longish, sessile. *Flowers* axillary, solitary, nearly sessile, yellowish-red, with dark veins.

O. dentata. Cavan. Ic. t. 398.—Leaves linear, toothed. Capsules very slender, square.—Found also in Chili and flowering in November. *Stem* a foot or more in height, round, with alternate branches. *Leaves* alternate, sessile, thickly though minutely toothed. *Flowers* axillary, solitary, sessile, yellow, with dark veins.

O. acaulis. Cavan. Ic. t. 399.—Leaves pinnatifid; the terminal lobe larger, toothed.—Found also near Chili, flowering in November and December. *Root* thick and fibrous, from whence spring the sessile *flowers*, and all radical *leaves*, which are sprinkled with white hairs. *Flowers* several, very large and showy, of a white or flesh colour beautifully variegated with veins.

O. rubra. Cavan. Ic. t. 400.—Stem herbaceous, erect, branched. Leaves ovato-acute, ferrulated.—The country of this species is uncertain. It was cultivated in the Royal Garden of Madrid, where it flowered in July and August 1796. *Root* annual. *Stem* a foot high, round, branched. *Leaves* alternate, stalked. *Flowers* axillary, solitary, stalked, of a light red colour.

This last appears to us, notwithstanding the author's remarks, to be but too near akin to the *rosea* above described.

CENOTHERA, in *Gardening*, comprises plants of the herbaceous, biennial, perennial, and under-shrubby perennial kinds; of which the species cultivated are, the broad-leaved tree-primrose (*O. biennis*); the long-flowered tree-primrose (*O. longiflora*); the soft tree-primrose (*O. mollissima*); the shrubby tree-primrose (*O. fruticosa*); and the dwarf tree-primrose (*O. pumila*).

Method of Culture.—These plants are all capable of being raised from seeds, and some of them by parting the roots and cuttings.

The seed should be sown either in the autumn or early spring, in the first and third sorts, upon a bed or border in the open ground, thinning and watering the plants properly, and keeping them free from weeds till the following autumn, when they may be removed, with balls of earth about their roots, to the places where they are to remain: or some may

be set out, at the time of thinning, in nursery-rows, six inches apart.

They also rise without trouble, from the scattering of the seeds.

But in the second sort, the seed should be put into the ground in the open borders, or other parts, about the latter end of March, where the plants are to remain. One plant is sufficient in a place, which should have a stick set to support its branches, when they have advanced a little.

The fourth sort may be readily increased by sowing the seeds as above, and by parting the roots and cuttings of the young branches, planting them out in the open borders, or other places where they are to grow, in the autumn, for the first method, and the spring for the latter, giving water as there may be occasion.

And in the fifth sort, the seeds should be sown in pots of light earth in the autumn, plunging them in a hot-bed frame during the winter. When the plants have attained proper growth in the spring, they should be removed into separate pots, which should be protected in the following winter under a garden-frame; and some may be planted out in the open ground, where they often succeed in mild winters.

The parted roots should be planted out in the spring, either in pots or the open ground.

The plants raised from seed are in general the best, as flowering more strongly.

By cutting down the stems of the plants in the first year of their flowering, before they perfect their seeds, the plants may sometimes be rendered more durable.

The first two sorts, as has been seen, are biennial, and the others perennial; the former should, of course, be raised annually.

They are all proper for affording ornament and variety, either in the open ground, or among other potted plants. The second and third sorts are often considered as greenhouse plants, but they succeed well in the open ground.

CEPATA, in *Botany*, a name by which some authors have called the tree which produces the fruit called *anacardium Orientale*, or the Malacca bean.

OEPEIN, in *Geography*. See **EUPEN**.

OERI. See **AWERRI**.

OERI, a town of France, in the department of the Roer; 10 miles N.W. of Venloo.

OERNETZ, a town of Sweden, in Dalecarlia, where Gustavus Vasa found refuge, and was prevented from being betrayed, by the wife of his host; 5 miles S. of Fahlun.

OERNHIELM, **CLAUDIUS**, frequently called *Arrhenius*, in *Biography*, historiographer to the king of Sweden, was born at Linköping in the year 1627. Having been educated in his native place, he went for farther improvement to the academy at Upsal, where he applied himself very diligently to polite literature, making history the principal object of his pursuit. In 1657 he was invited to accompany the count Oxenstierna in a tour to foreign countries; and on his return to Sweden, he became teacher in the academy of Upsal, and afterwards professor of logic and metaphysics. In 1668 he was chosen professor of history; and in this situation he exerted his talents to throw light on the history of his own country, which till that period had been involved in great obscurity. It was at this time that government established an institution, denominated the College of Antiquities, of which our author was appointed a member. This afforded him an opportunity to examine all the ancient records of the kingdom; and by these means he collected a most extensive fund of materials for the favourite object of his pursuit. In 1687 he resigned his professorship, and was chosen librarian to the academy,

after having been ennobled by the name of Oernhielm. In 1689 he was made "Censor librorum regius," and died at Stockholm in 1695. The titles of his works are given in the General Biography: of these the principal are, "Historiæ Suecorum Gothorumque Ecclesiasticæ Libri iv. priores;" "Vita Illust. Herois Ponti de la Gardie;" "Museum Upsalienum Pietas in Carolum XI. Regem Sueciæ," 1673. Oernhielm had, previously to his decease, been appointed by the government of his country to draw up a description of all the towns, parishes, churches, &c. in Sweden, adapted to count Dahlberg's views of them; but this work was suspended by his death.

OESCH, or OEX, in *Geography*, a town of Switzerland, in the canton of Berne; 19 miles S. of Friburg.

OESEL, a rocky island of the Baltic, or East sea, called in Esthnic *Kurrafsaar*, *i. e.* Crane island, but by the inhabitants Sarema, *i. e.* the island. The former name is conjectured to have been formed from the Kures, who frequently made common cause with the Oeselians; and the Lettish denominated this island Sahma femme, which might be changed into Sahn femme, *i. e.* Side-land. The length of the island, from Palmarort to the point lying south-east of the light-house of Soarverort, is about $11\frac{1}{2}$ Swedish miles, or nearly 118 versts. In breadth it greatly varies: its largest being $9\frac{1}{2}$ miles, or 99 versts; and its smallest at the isthmus, north-east of the creek of Kylla, is about $2\frac{1}{2}$ versts. The temperature of the air is moderate and salubrious; the soil being in most parts sand, loam, and clay, is therefore poor; but after good manuring with cow-dung or sea-weed, and proper culture, it produces good corn, particularly wheat, rye, and barley; in favourable seasons, likewise oats and pease. In dry summers, the parts that are quite sandy seldom yield good barley, as it then runs altogether to straw. On this island are many beautiful flowers; and the stone quarries are fine, and very productive. Many large blocks of limestone, which have been formed into statues, and slabs for table-monuments, &c. as well as beautiful and rare stones, and marble, have been obtained from this island. The character of the Oesel peasantry much resembles that of their brethren the Esthonian; except that the former are more cleanly and orderly, and are generally not addicted to drinking; but if they indulge to excess, they prefer beer to brandy. In music and dancing, the Oeselians manifest superior taste to that of the inhabitants of the adjacent continent; tolerable airs being produced by the boors from their favourite instrument, the bagpipe: they have likewise two sorts of dances, one called the great or high dance, and the other the little dance. Their houses are more commodious and better adapted to health than those of the Esthonian; they have windows, and some begin to have chimnies. In some few of the rooms they have deal-floors; and those of the wealthier class no longer burn laths for light, but use tallow candles; and the opulent boors along the coast have iron lamps with sea-dog oil. These elegancies, however, are rare. The Esthonian and Lettish are furnished annually with an almanac in their own language; but the boors of Oesel make their own kalendar: for which purpose, as they cannot write, they have selected certain signs, which they mark in an artless manner on seven narrow flat sticks tied together by a thong, or more properly on thirteen sides. On each side is a month, consisting of 28 days. By this kalendar they learn at once every week-day, every immovable festival, and every day that is memorable among them on account of any superstitious rites; for each has its peculiar sign. They begin to reckon every successive year one day later than the last; and in the use of the kalendar, they follow the practice of the Hebrews,

and other Oriental nations, who begin their books at that part which we deem the end, and read from right to left. Tooke's *Russia*, vol. i.

ÆSOPHAGEUS, in *Anatomy*, an epithet applied to the arteries, &c. of the œsophagus.

ÆSOPHAGOTOMY, in *Surgery*, from *αισοφαγος*, the gullet, and *τομω*, to cut, the operation of making an incision into the œsophagus, or gullet. The circumstances under which such a measure seems necessary, as well as the mode of operating, are detailed in the article *ÆSOPHAGUS*, *Removal of foreign Bodies from*.

ÆSOPHAGUS, in *Anatomy*, from *φερω*, *οισω*, to carry, and *φαγω*, to eat, the membranous and muscular tube which conveys the food from the throat to the stomach. See *DEGLUTITION*.

ÆSOPHAGUS, *Removal of foreign Bodies from*, in *Surgery*. When an extraneous body lodges in the œsophagus, it ought either to be taken out, or forced down into the stomach.

1. The most simple method of executing the first of these operations, consists in extracting the foreign body with the fingers, if it should lie within their reach, or with forceps, the size and shape of which must vary according to circumstances. If it should be situated far down the passage, common forceps will not answer. They must then be made of a longer and stronger construction, and curved like those which are used for extracting polypi from the nostrils. Such forceps, as well as other instruments, which will be presently noticed, should be carefully introduced. The patient being seated on a chair, with his head resting upon the breast of an assistant, who is to keep it steady by applying his hands to the forehead, and hold it moderately back, the surgeon is to convey the index finger of his left hand over the base of the tongue, which must be depressed, and on this finger he is to conduct the forceps, observing to make them glide along the posterior parietes of the œsophagus, in order that the larynx may not be at all touched, for when this happens, the latter part is irritated in a degree that always adds seriously to the patient's suffering.

When the foreign body has descended too far to be reached by the fingers or forceps, it may sometimes be extracted with a long piece of strong double wire, the extremity of which is shaped like a hook. This sort of instrument would tear the internal membrane of the œsophagus, if it were not employed with the utmost caution. It has been recommended for the extraction of angular bodies. These might be equally well removed, and without any risk, by means of a flexible silver wire, doubled into a noose, and having its two ends twisted one over the other. Some surgeons have made use of common catheters, into the eyes of which are introduced several loose pieces of packthread. M. J. L. Petit suggested using, in this case, a whalebone probang, or long silver probe, at the end of which small rings were placed, connected together like those of a watch chain.

It was customary with the ancients to make the patient swallow a bit of sponge dipped in oil, and attached to some thread, which passed through the middle of it. Fabricius Hildanus afterwards fixed the sponge upon the end of a hollow silver, or copper-probe, perforated with apertures. Others conceived that the sponge might be more conveniently introduced if it were fixed on something flexible, like a long piece of whalebone. At length J. L. Petit rendered this instrument as safe as it could be made, by including the whalebone in a tube of flexible silver, which was constructed of spiral silver wire, while the sponge was also fastened by means of a wire of the same metal.

It may readily be conceived how bodies, whose form is angular, and substance solid, will follow the sponge, in which their

their asperities become engaged. Those which are soft will not so easily do so, though some have occasionally been drawn out, which, it was supposed, would never have been got hold of in this way. Dr. Cleghorn, a physician at Dublin, has related to the medical society of London, an instance, in which he thus drew out of the œsophagus a quill, that a girl, deprived of her senses, had let slip down this canal, in endeavouring to excite vomiting with it. One of Dr. Cleghorn's friends, apprehensive that the quill might, from its size, occasion bad consequences, if introduced into the stomach, was averse to its being forced downward; and this physician conceived that if the sponge could be got far enough down the œsophagus, the moisture would make it expand, and that the feather of the quill might get entangled in it, and so admit of being extracted. For greater safety, he passed two strings through the sponge, in order that he might be able to pull it out in case it should slip off the whalebone.

The instrument was introduced twice without success; it was then turned round with a view of making the sponge and string take better hold of the feather. The plan did not succeed till the third attempt, when the extraneous substance was brought up high enough to admit of being taken hold of with the fingers, after it had remained in the throat two hours. Although the patient was bled the same evening, inflammation took place. Hence a second bleeding became necessary; this gave relief, and the girl recovered. If the quill had passed into the stomach, it might have occasioned acute pains in this organ, as the author of the "Zodiacus Medico-Gallicus" observed in a singing master, who was troubled for two years after swallowing such an extraneous substance. The pain was violent for six months; no vestiges of the quill were noticed in the stools. Another person at Dublin informed Dr. Cleghorn that a pen had been drawn out of the œsophagus in another instance by the preceding means. The pen was not extracted till the third attempt; the patient afterwards felt no inconvenience, and, the next day, called upon the gentleman who had relieved him, for the purpose of returning thanks.

2. When the foreign body, lodged in the œsophagus, cannot be removed by the means above explained, the only plan is either to promote its descent into the stomach, or else to force it down into this viscus. The first of these indications is said to have been sometimes fulfilled by giving the patient a few gentle blows on the back with the palm of the hand, and also by making him laugh. When he can swallow liquids, we are likewise advised to direct him to drink a large quantity of water at a time. Sharp bodies of small size have occasionally been either carried downward, or rendered easy of deglutition, by means of pulpy food, such as pap, bouillie, pease soup, French plums peeled, fresh figs, or dried ones turned inside out. When these simple means do not answer, the foreign body must be pushed down into the stomach. Anciently, a long metallic instrument was employed for this purpose; its end was the largest part of it, and rounded into the shape of an olive, or little ball. Its use was continued until the end of the 17th century, and Verduc recommended it at a still later period. Paré, however, made use of a leek, the flexible stalk of which allowed it to adapt itself to the curvature of the parts through which it had to pass. Fabricius ab Aquapendente preferred a large sort of wax candle, which was oiled and softened by being warmed. From an apprehension that the leek might break in the œsophagus, and thinking that the wax candle was likely to be either too hard, or too much softened, M. J. L. Petit gave up these means, and proposed the employment of sponge fixed on a piece of whalebone, which was itself

included in a silver cannula as already described. At the present day, the silver tube is not used, and the instrument, in its more simple form, is termed by surgeons a *probang*.

In the foregoing observations, it has been supposed that the suffocation produced by the foreign body in the œsophagus is not extremely urgent, and that the foreign body itself, the angular shape of which is known, admits of being displaced, and makes no external projection. Should it be of large size, and should the pressure, which it makes upon the trachea, interrupt respiration, as happened in the case recorded by M. Habicot in the *Mém. de l'Acad. de Chirurgie*, bronchotomy is indispensably requisite, after which the means calculated for the extraction of the foreign body, or for the promotion of its passage down into the stomach, must be practised. If the extraneous substance, though of smaller size, should be firmly fixed, and project outwardly, there is a possibility of relieving the patient by making such an opening into the œsophagus as will allow the foreign body to be extracted. Verduc, to whom we are indebted for the first suggestion of this operation, now termed *œsophagotomy*, asserts that its difficulties are amply counterbalanced by the danger in which the patient is of dying in the event of its not being performed. Guattani afterwards took up the subject, to which his attention was excited by an occurrence which he had an opportunity of witnessing at Rome. A man, playing with a chestnut, threw it up into the air, and caught it in his mouth. He soon complained of inability to swallow, and was conveyed to the hospital of the Santo Spirito. As he could speak and breathe easily, had vomited since the accident, and was intoxicated when it happened, it was not supposed that the chestnut had been swallowed. Very bad symptoms, however, came on, and he died on the nineteenth day. Guattani opened the left side of the neck, below the larynx and thyroid gland, which was considerably swelled. He soon came to the cavity of a large abscess, in which the entire chestnut was situated. The œsophagus was much contracted both above and below this body, and the abscess which it had caused communicated with the trachea by a gangrenous aperture in the membranous parietes of the latter tube.

The observations of Eustachius, Winslow, Haller, and Morgagni, had apprized Guattani that the œsophagus, instead of descending in a straight line along the back of the trachea, inclines a little to the left, and hence the latter surgeon proposed opening the neck on that side in the operation of œsophagotomy. The patient being seated on a chair, with his head carried backward, and resting on the breast of an assistant, the surgeon is to divide the integuments, the subcutaneous cellular substance, and that which lies betwixt the sterno-hyoidei and thyro-hyoidei muscles. These muscles and the trachea are then to be separated from the œsophagus by drawing the sides of the wound away from each other by means of blunt hooks. If any large vessel should bleed, it must either be secured with a ligature, or compressed with the finger of an assistant. Lastly, an opening is to be made into the œsophagus over the foreign body, which is to be extracted with the fingers, or forceps. The wound requires only simple dressings, and from some experiments upon dogs, it is concluded that it will readily heal. These experiments were attended with no difficulty, and that which Guattani performed in the presence of M. Faget, upon the human dead subject, was done with equal facility.

The French academy of surgery, to which Guattani presented his reflections, had annexed to an extract from his memoir two cases of œsophagotomy, successfully practised on two living men. One instance was communicated by Gourlaud,

Gourfaud, a member of the academy. This fact, being detailed in a concise way, may be advantageously introduced in the present place. An individual swallowed a bone, an inch long, and six lines in breadth. Various endeavours were made to force it down into the stomach; but, as they were ineffectual, and the bone could be felt on the left side, Gourfaud's father made an incision over the foreign body, with a view of extracting it. The operation was followed by no remarkable symptoms. During a week, the patient took nothing by the mouth, being nourished with glysters. The historian of the academy adds, that a similar operation was successfully practised by a military surgeon, named Roland.

Extraneous substances of every kind, and especially such as have a sharp figure, may elude all attempts made either to extract them, or force them down into the stomach. For a long while they may occasion only such inconveniences as are supportable, and, in the end, they may be voided by the mouth, or make their way through the parts between themselves and the surface of the body, where they produce an abscess, from which they are discharged. In the first volume of the Memoirs of the French Academy of Surgery, M. Hevin has quoted from Hoelteterus, a case, in which a young man, who, in his sleep, had swallowed a piece of gold that he had put in his mouth, voided it from this part at the expiration of two years, after suffering a variety of complaints, and falling into a state of coma, that threatened his life. The same author also cites some instances of foreign bodies, such as pins, needles, and fish-bones, which, after lodging more or less time in the substance of the lungs, presented themselves externally, and were extracted by incisions, which only reached through the integuments.

Amongst the foreign bodies which slip into the œsophagus, there are many, which pass through it into the stomach. If their substance should be hard, their size considerable, and their figure sharp, their presence may give rise to the utmost danger. Art can here afford little relief; but nature has resources which seem extraordinary. The practitioner may, indeed, prescribe oily and mucilaginous draughts, and thick soups, which will, in some measure, defend the alimentary canal from the rough surface of the extraneous substance. Perhaps, also, these means may also sometimes have promoted the expulsion of the hurtful body. But nothing is clearer than that, in many of the cases on record, they could have had no effect of the foregoing kind. A shoe-buckle, which a child swallowed in playing, has been known to be discharged with the stools. Likewise a small tin cover, a pipe four inches in length, long pieces of the sword blades, whole knife blades, a fork, a silver spoon, &c. after being swallowed, have, in different examples, been voided from the anus. But yet it frequently happens that bodies of these descriptions frequently destroy the patient, or cause abscesses in different parts of the abdomen, and are discharged with the matter. Lastly, those foreign bodies which pass all through the intestinal canal, and present themselves at the anus, often make their way through the coats of the rectum, and produce abscesses of the fundament. See Sabatier's Médecine Opératoire, tom. iii.

ÆSOPHAGUS, *Strictures of*. See STRICTURES.

ÆSOPHAGUS, *Wounds of*. See WOUNDS.

OESTRINGEN, in *Geography*, a town of the duchy of Baden; 14 miles E. of Spire.

ÆSTROMANIA, a name given by some authors to the uterine disorders, which sometimes affect young women, and is commonly called *furor uterinus*.

ÆSTRUM VENERIS. See VENERIS.

ÆSTRUS, the Gad-fly or Breeze, in *Entomology*, a genus of insects of the order of Diptera: the generic cha-

rafter is as follows. The mouth has a simple aperture, and not exerted; it has two feelers, each having two articulations; it is orbicular at the tip, and seated on each side in a depression of the mouth; the antennæ have three articulations, the last of which is subglobular, and furnished with a bristle on the fore-part, placed in two hollows on the front.

The face of this singular genus is broad and depressed; it is vesicular and glaucous, and has been thought to bear some resemblance to the ape kind. The different species are extremely troublesome and even destructive to horses, sheep, and other cattle, depositing their eggs in different parts of the body, and producing painful tumours and sometimes death. The larvæ are without feet, short, thick, soft, and annulate, and often furnished with small hooks. There are twelve species, of several of which so full an account is given in our article BOTTS, that we feel it necessary, in this case, to do little more than enumerate the species, with a very brief description of the specific character.

Species.

* BOVIS. Wings immaculate, brown; abdomen with a black band in the middle and orange-yellow hair at the tip. It deposits its eggs in the back of cattle under the skin, which, as they are changed into larvæ, produce a purulent tumour. The larva of this species is brown, and has eleven segments with transverse, rough, interrupted lines.

* EQUI. Whitish, with a black band in the middle and two dots at the tip. There is a variety, of which the wings have a single, oblong, black spot at the tip; the abdomen is covered with thick brown ferruginous hairs. This is the *O. vituli* of Fabricius.

* HÆMORRHOIDALIS. Wings immaculate, brownish; abdomen black, the base white and fulvous at the tip. This insect is about half the size of the last; the female has a black incurved appendage behind; the larva is less, but in other respects exactly like the last.

* VETERINUS. Wings immaculate; body ferruginous; sides of the thorax and base of the abdomen with white hairs. This is the *O. nalis* of Gmelin and the *O. equi* of Fabricius; it is less than the *O. equi* described above.

* OVIS. Wings pellucid, punctured at the base, abdomen variegated with black and white. This is less than the *O. equi*; the larva is white, ovate, pointed with two hooks, truncate behind, with a prominent margin, and two black respiratory scales. Above it is convex, with black lines and dots; beneath flat, with minute, rough, black dots in the middle of the segments.

Of all the foregoing species, which, as the asterisks shew, are to be met with in our own country, much interesting matter will be found in the article BOTTS, already referred to. The reader is also referred to a valuable paper in the third volume of the Linnæan Transactions, in which the several species are all figured.

CUNICULI. Black; wings brown; thorax black as far as the middle, behind and base of the abdomen with yellowish hairs. It inhabits Georgia. It deposits its eggs in the skins of hares and rabbits. It is twice as large as the *O. bovis*. The sides of the abdominal segments are yellow; the body beneath is black. The larvæ are brown; every where rough, with very minute prickles.

BUCCATUS. Grey; face white, dotted with black. It inhabits Carolina, and is a large insect.

TARANDI. The wings of this species are immaculate; thorax yellow, with a black band; the abdomen is fulvous, tipped with black. It inhabits Lapland. Deposits its eggs on

on the back of rein-deer, which produce larvæ, that are often fatal to them.

TROMPE. Wings white; body black, with cinereous hairs; thorax with a deep black band. It inhabits Lapland, and on the rein-deer.

ANTILOPE. Wings with a brown band and dots; body hairy, tawny-grey; abdomen with three rows of blackish spots. It inhabits Asia, and deposits its eggs on the back of the antelope.

FASCICULOSUS. Downy, yellow; tail with three tufts of blackish hairs. This is a Siberian insect.

HOMINIS. The body of this species is entirely brown. It inhabits South America. It deposits its eggs under the skin, on the bellies of the natives. The larva, if it be disturbed, penetrates deeper, and produces an ulcer, which frequently becomes fatal.

ÆSYPE, or **ÆSYPOS**, a kind of fatty mucilage, of the consistence of an unguent, of a greyish colour, and a sickish disagreeable smell, drawn from the greasy wool growing on the throats and between the buttocks of sheep.

The word is formed from the Greek *ovs*, *sheep*, and *σνπω*, *I putrefy*, or *corrupt*; the æsype being a filthy, and as it were, corrupted matter drawn from sheep.

This wool they wash, boil it in water, let the lotions or decoctions stand for some time, and from the top skim off a fatty substance, which being strained through a linen cloth, and set to cool, makes the æsype much used externally to resolve, soften, and appease pain.

ÆTHODES ULCUS, a term used by the Greek writers for such ulcers as had tumid and callous lips; and as such ulcers are usually very difficult to heal, the word became afterwards appropriated to all sorts of ulcers difficult to cure.

OETSKAIA, in *Geography*, a town of Russia, in the government of Irkutsk; 40 miles N. of Irkutsk.

OETTING, NEW, a town of Bavaria; eight miles N.W. of Burkhaußen. N. lat. $48^{\circ} 12'$. E. long. $12^{\circ} 38'$.

OETTINGEN, or **OETTING**, a county of Germany, situated N. of the Danube, bounded E. by the duchy of Nauburg, and W. by the provostship of Elwaugen; about 30 miles long and 18 broad. The Roman Catholic and Lutheran religion are equally professed in the country.—Also, the capital of the fore-mentioned country, situated on the Wernitz, the seat of the regency and treasury, and containing a society of arts, a grammar-school, and an orphan-house; 14 miles S. of Anspach. N. lat. $48^{\circ} 57'$. E. long. $10^{\circ} 37'$.

OEVARA, a town of South America, in the province of Choco; 40 miles N. of Zitara.

ŒUVRE, Fr. **OPERA**, Ital. This word, during the last century, and even earlier, was usually prefixed to each work of a musical composer; as *Opera prima* of Corelli, *Opera quinta* of Vivaldi, &c. But these titles seem now less in constant use than formerly. In proportion as music approaches perfection, it loses these pompous names, by which authors imagined themselves glorified. Rousseau.

OEYRAS, in *Geography*, a town of Portugal, in Estramadura, on the Tagus; eight miles W. of Lisbon.

OEYRAS, New, a town of Africa, in the kingdom of Angola.

OFANTO, a river of Naples, which rises near Conza, and runs into the Adriatic; 12 miles W. of Trani.

OFARA, a town of Japan, in the island of Nippon, and capital of a kingdom called Fida; 100 miles N.W. of Jedo.

OFENA, a town of Naples, in Abruzzo Ultra; 14 miles E. of Aquila.

OFESCA, a town of Servia, on the N. side of the Danube, opposite Belgrade.

OFF, a nautical term, applying to the movement of a ship when she sails from the shore towards the sea. When a ship is beating to windward, so that by one board she approaches towards the shore, and by the other more towards the sea, she is said to stand *off* and *on* shore.

OFF-Bank of a canal, is the bank I K, (*Plate I. Canals, fig. 15.*) which is on the contrary side of the canal from the towing-path *lc.*; and *off-slope* is the side L I, that is opposite to *lc.*

OFFA, in *Biography*, king of the Mercians, one of the Saxon princes of the heptarchy, whose power and talents have rendered them worthy of commemoration. He succeeded to the throne by the general consent of the people, after a successful insurrection against Ethelbald, an usurper, in 755. He had scarcely ascended the throne, when he exhibited an ambitious spirit, which was not to be restrained within common boundaries; he made war upon Lothaire, king of Kent, and Kenwulph, king of Wessex. The former he defeated in a bloody battle at Otford, a village near Seven-Oaks, and reduced his kingdom to a state of dependence: over the latter he gained a victory at Benington, in Oxfordshire, and conquering that county, together with Gloucester, annexed both to his dominions. These successes were stained by his treacherous murder of Ethelbert, king of the East-Angles, and his violent seizing of that kingdom. This young prince, who is said to have possessed great merit, had paid his addresses to Elfrida, the daughter of Offa, and was invited with his retinue to Hereford, in order to solemnize the nuptial. Amidst the joy and festivity of these entertainments, he was seized by Offa, and secretly beheaded: and though Elfrida, who abhorred her father's treachery, had time to give warning to the East-Anglian nobility, who escaped into their own country, Offa, having extinguished the royal family, succeeded in his design of subduing that kingdom. At another time he joined Kenwulph in an invasion of Wales, by which the Britons were driven to the mountains, and obliged to abandon all the low country. For the security of his conquests, Offa caused to be dug that dyke, which still bears his name, extending from the mouth of the Wye to the Dee. Offa, by his various successes, had now become the most potent prince in the island, and was even respected for his power and abilities by the celebrated Charlemagne, who entered into a league of friendship with him. At the desire of that sovereign the learned Alcuin was induced by Offa to visit his court, and devote himself to his service. The chief reason why he desired the company of Alcuin was, that he might oppose his learning to the heresy of Felix, bishop of Urgil, in Catalonia, who maintained that Jesus Christ, considered in his human nature, could more properly be denominated the adoptive, than the natural son of God. This heresy was condemned in the council of Frankfort held in 794, consisting of 300 bishops. "Such," says Hume, "were the questions which were agitated in that age, and which employed the attention not only of cloistered scholars, but of the wisest and greatest princes." Either real remorse for his crimes, or a hypocritical affectation of piety, led Offa, in his latter years, to pay an almost unbounded respect to the clergy, and to practise all the superstitious devotion of the times. He gave a tenth of his goods to the church, and made liberal donations to the see of Hereford, which city was at that time his principal residence. He pretended to have been directed by a vision to the reliques of
the

the proto-martyr of England, St. Alban, near Verulam, and founded a magnificent monastery on the spot. At length he made a pilgrimage to Rome, where he lavished great sums to procure the papal absolution and benediction, and agreed to an annual payment to the pope for pious and charitable purposes, which he raised by a heavy tax on his subjects, afterwards converted into the imposition termed Peter-pence. Offa died in 794, after a reign of thirty-nine years of uninterrupted external prosperity. Malmesbury, one of the best of the old English historians, declares himself at a loss to determine whether the merits or the crimes of this prince preponderated. Hume and Henry.

OFFA Alba, a name which Van Helmont gives to the white coagulum, arising from a mixture of rectified spirit of wine with spirit of urine, or spirit of sal ammoniac.

Note, The spirit of urine must be distilled from well fermented wine, and the other must be well dephlegmated; else no offa will arise.

Some call it the offa alba of Paracelsus, others of Van Helmont; whence it is sometimes called *offa Helmontiana*; but Van Helmont was not the inventor of it, but Raim. Lully, says Boerhaave.

The manner of making the offa alba is described by this last author, who observes it to be difficult, as it requires both liquors to be perfect, and some nice circumstances to be observed.

Van Helmont endeavours to account for the formation of the stone in the bladder, from this experiment; but as Boerhaave observes, the offa alba has nothing in common with the stone.

Boerhaave recommends this mixture as a good deobstruent, taken in Canary, fasting.

OFFA'S Dyke, in *Geography*. See *Offa's DYKE*.

OFFAK HARBOUR, a port on the N. coast of the island of Waygoo, on the Line. E. long. 131° 6'.

OFFELING, a town of Austria; 16 miles S.W. of Freystadt.

OFFEN. See **BUDA**.

OFFEN See, a lake of Austria; 16 miles E. of St. Wolfgang.

OFFENBACH, a town of Germany, in the county of Iffenburg, on the Maine, containing two Protestant churches, a synagogue, and quay, and several manufactures; three miles E. of Frankfurt on the Maine.

OFFENBURG, a town of Germany, situated on the Kinzeg, in the Ortenau, originally imperial. In the year 1802, it was given to the duke of Baden. The inhabitants are Roman Catholics; 24 miles S.S.W. of Rastatt. N. lat. 48° 27'. E. long. 7° 58'.

OFFENCE, DELICTUM, in *Law*, an act committed against the law, or omitted, where the law requires it.

Offences are distinguished into two kinds, *viz.* such as are capital, and such as are not. Capital offences are those for which the offender is to lose his life. Those not capital, where the offender may forfeit his lands and goods; be fined, or suffer corporal punishment, or both, but not lose his life. (Hale, P. C. 2. 126. 134.) Under capital offences are comprehended high treason, petit treason, and felony; and offences not capital include the remaining part of the pleas of the crown, and come under the title of misdemeanours.

Some offences are punishable by the common law, but most of them by statutes.

Judge Blackstone distributes the several offences, which are directly or by consequence injurious to civil society, and therefore punishable by the laws of England, under the following general heads: first, those which are more immediately in-

jurious to God and his holy religion; secondly, such as violate and transgress the law of nations; thirdly, such as more especially affect the sovereign executive power of the state, or the king and his government; fourthly, such as more directly infringe the rights of the public or commonwealth; and, lastly, such as derogate from those rights and duties, which are owing to particular individuals, and in the preservation and vindication of which the community is deeply interested. To the first class belong *apostasy, heresy*, those which affect the established church, by reviling its ordinances or nonconformity to its worship, *blasphemy*, profane and common swearing and cursing, the offence of *witchcraft, conjuration, enchantment or sorcery*, that of *religious impostors, simony*, profanation of the Lord's day, vulgarly (but improperly) called *Sabbath-breaking, drunkenness*, and open, notorious *lewdness*. The second class of offences comprehends violation of *safe-conducts* or *passports*, those which affect the rights of *embassadors*, and the crime of *piracy*. The offences belonging to the third general division are *treason, felonies* injurious to the king's *prerogative, premunire*, and other *misprisions and contempts*. The fourth class of offences may be divided into five species, *viz.* offences against public *justice*, against the public *peace*, against public *trade*, against the public *health*, and against the public *police* or *economy*. The last class includes crimes and misdemeanours against private subjects, which are principally of three kinds, against their *persons*, their *habitations*, and their *property*. For an account of each of the offences above enumerated, and those that belong to each class, we refer to the appropriate articles in the Cyclopædia.

OFFENHAUSEN, in *Geography*, a town of Germany, in the territory of Nuremberg; five miles N.N.W. of Altorff.

OFFERING. See **OBLATION**, and **HEAVE-offering**.

OFFERING, Burnt. See **HOLOCAUST**.

OFFERTORY, OFFERTORIUM, an anthem sung, or a voluntary played on the organ, at the time the people are making an offering.

Anciently, the offertory consisted of a psalm sung with its anthem; though it is somewhat dubious whether the psalm was sung entire; St. George mentioning, that when it was time, the pope, looking at the choir who sung it, gave the sign when they should end.

OFFERTORY was also a name anciently given to the linen whereon the offerings were laid. Dr. Harris says, it was properly a piece of silk, or fine linen, wherein the occasional oblations or offerings of each church were wrapped up.

OFFICE, OFFICIUM, in a moral sense, denotes a duty; or that which virtue and right reason direct a man to do.

Virtue, according to Chauvin, is the purpose of doing well: the thing which immediately follows, or arises from this purpose, is obedience; which same is also denominated *officium*: so that an office is the object of an obedience to *virtue*; which see.

Cicero, in his discourse of "offices," censures Panætius, who had written before him on the same, for omitting to define the thing or subject on which he wrote; yet he does himself fall under the same censure. He insists much on the division of offices, but forgets the definition. In other of his pieces we find him defining office to be an action, which reason requires to be done: "Quod autem ratione actum sit, id officium appellamus."

The Greeks, he observes, made two species of office: *perfect*, called by them *κατορθωσις*; and *common*, or *indifferent*, called *καθηκον*: which they define so, as that, what is absolutely right, makes a *perfect* office; and what we can

only give a probable reason for, a *common* or *intermediate* office.

OFFICE, in a civil sense, denotes the mutual aid and assistance which men owe to one another.

Benevolence inspires a man with an endeavour to do good offices to all mankind.

OFFICE is also a particular charge, or trust, whereby a man is authorized to do something.

Loyseau defines office a dignity attended with a public function. The word is primarily used in speaking of the offices of judicature and policy: as, the office of a secretary of state, that of a justice of peace, of a sheriff, &c.

Offices are either venal, or not venal. *Venal* offices are those bought with money; and they are subdivided into two kinds; viz. *dominial* and *casual*. *Dominial*, or *offices in fee*, are those absolutely torn off, and separated from the king's prerogative, so as not to become vacant by death, but passing in the nature of a fee or inheritance.

Of these we have but few instances among us, which go beyond a first reversion. Among the French they are more frequent.

Casual offices are those given for life, by patent, commission, &c., and which become vacant by the officer's death, to the king's benefit; unless the officer have before resigned, or disposed of it.

OFFICE, *Alienation, Alternate, Crown, Jewel, Post*. See the respective articles.

OFFICE, *Virtualing*. See VIRTUALING.

OFFICE is also used for a place, apartment, or board appointed for the officers to attend in, for the discharge of their respective duties or employments.

Such are the secretary's office, first fruits office, the fix clerks office, the paper office, signet office, the prothonotary's office, pipe office, king's silver office, excise office, office of ordnance, &c. See SECRETARY, FIRST-FRUIT, SIX CLERKS, PAPER, PIPE, SIGNET, EXCISE, ORDNANCE, &c.

Of such offices, some are distinguished by the name of *board*, and other of *chambers*, as the board of green cloth, &c.

Where the inquisition obtained, the tribunal of it was called the *holy* office.

OFFICE, in the *Canon Law*, is used for a benefice, which has no jurisdiction annexed to it. See BENEFICE.

OFFICE is also used, in *Common Law*, for an inquisition or inquest of office, which is an inquiry made by the king's officer, his sheriff, coroner, or escheator, *virtute officii*, or by writ sent to them for that purpose, or by commissioners specially appointed, concerning any matter that intitles the king to the possession of lands or tenements, goods or chattels. (Finch. L. 323, 4, 5.) This is done by a jury of a determinate number; being either twelve, or less, or more. These inquests of office were more frequently in practice than at present, during the continuance of the military tenures amongst us: when, upon the death of every one of the king's tenants, an inquest of office was held, called an "Inquisitio post mortem," to inquire of what lands he died seised, who was his heir, and of what age, in order to entitle the king to his marriage, wardship, relief, primer-seisin, or other advantages, as the circumstances of the case might turn out. To superintend and regulate these inquiries the court of wards and liveries was instituted by 32 Hen. VIII. c. 46; which was abolished at the restoration of king Charles II., together with the oppressive tenures upon which it was founded. With regard to other matters, the inquests of office still remain in force, and are taken upon proper occasions; being extended not only to lands,

but also to goods and chattels personal, as in the case of wreck, treasure-trove, and the like; and especially as to forfeitures for offences. For every jury which tries a man for treason or felony, every coroner's inquest that sits upon a *felo de se*, or one killed by chance-medley, is, not only with regard to chattels, but also as to real interests, in all respects an inquest of office; and if they find the treason or felony, or even the flight of the party accused, (though innocent,) the king is thereupon, by virtue of this "office found," entitled to have his forfeitures; and also, in the case of chance-medley, he or his grantees are entitled to such things by way of deodand, as have moved to the death of the party. These inquests of office were devised by law, as an authentic means to give the king his right by solemn matter of record; without which he in general can neither take nor part from any thing. For it is a part of the liberties of England, and greatly for the safety of the subject, that the king may not enter or seize any man's possessions upon bare surmises, without the intervention of a jury. (Finch. L. 82. Gilb. Hist. Exch. 132. Hob. 347.) It is, however, particularly enacted by 33 Hen. VIII. c. 20. that, in case of attainder for high treason, the king shall have the forfeiture instantly, without any inquisition of office. And as the king hath (in general) no title at all to any property of this sort before office found, therefore it was enacted by 18 Hen. VI. c. 6. that all letters patent or grants of lands and tenements before office found, or returned into the exchequer, shall be void. And by the bill of rights 1 W. & M. st. 2. c. 2. it is declared, that all grants and premises of fines and forfeitures of particular persons before conviction (which is here the inquest of office) are illegal and void; which indeed was the law of the land in the reign of Edward III. (2 Inst. 48.) With regard to real property, if an office be found for the king, it puts him in immediate possession, without the trouble of a formal entry, provided a subject in the like case would have had a right to enter; and the king shall receive all the mesne or intermediate profits from the time that his title accrued. (Finch. L. 325, 6.) As on the other hand, by the "articuli super cartas," 28 Edw. I. st. 3. c. 19, if the king's escheator or sheriff seize lands into the king's hand without cause, upon taking them out of the king's hand again, the party shall have the mesne profits restored to him. In order to avoid the possession of the crown, acquired by the finding of such office, the subject may not only have his "petition of right," which discloses new facts not found by the office, and "monstrans de droit," which relies on the facts as found; but also he may (for the most part) "traverse" or deny the matter of fact itself, and put it in a course of trial by the common law process of the court of chancery. Yet still, in some special cases, he hath no remedy left but a mere petition of right. (Finch. L. 324.) These "traverses," as well as the "monstrans de droit," were greatly enlarged and regulated for the benefit of the subject, by the statutes already mentioned and others. (34 Edw. III. c. 13. 36 Edw. III. c. 13. 2 & 3 Edw. VI. c. 8.) And in the traverses thus given by statute, which came in the place of the old petition of right, the party traversing is considered as the plaintiff; and must therefore make out his own title, as well as impeach that of the crown, and then shall have judgment "quod manus domini regis amoveantur," &c. Blackst. Com. b. iii.

From what we have delivered it appears that to traverse an office, is to traverse an inquisition taken of office before an escheator. To return an office, is to return that which is found by virtue of the office.

There are two sorts of offices issuing out of the exchequer

by commission; viz. an office to entitle the king in the thing enquired into; and an office of instruction.

OFFICE is also used for divine service celebrated in public. St. Jerom is the person, who, at the request of pope Damasus, is said to have first distributed the Psalms, Epistles, and Gospels, in the order in which they are now found in the Romish office. The popes Gregory and Gelasius added the prayers, responses, and verses; and St. Ambrose the graduals, hallelujahs, &c.

OFFICE is more particularly used, in the Romish church, for the manner of performing the service; which varies every day.

Thus they say the office of Sunday; the office of such a saint, &c. The office is either *single*, *half-double*, or *double*.

OFFICE, again, is applied to a particular prayer preferred in honour of a saint.

When any person is canonized, a particular office is at the same time assigned him out of the common office of the confessors, the Virgin, or the like. See SAINT and CANONIZATION.

We say, the office of the Virgin; of the Holy Spirit; of the passion; the holy sacrament, &c. The office of the dead is rehearsed every day, excepting on feast-days, among the Carthusians. The office of the Holy Virgin is also added to the office of the day, in the order of Bernardines.

OFFICES, with regard to *Architecture*, denote all the apartments that serve for the necessary occasions of a great house, or palace, or those where the servants are employed: as kitchens, pantries, brewhouses, confectionaries, fruiteries, granaries, &c. as also wash-houses, wood-houses, stables, &c.

The offices are commonly in the basse-cour; sometimes they are sunk under ground, and well vaulted.

OFFICE, in *Rural Economy*, the general name of any sort of farm, building, or place where business is transacted relative to a farm; or for the purpose of containing the animals, produce, or other things belonging to the farm. The great points to be aimed at in buildings of this kind are those of convenience and economy in labour. See FARM-BUILDINGS.

OFFICE of *Estate*, the name of the place where the principal business of it is transacted. Mr. Marshall, in his work on landed property, says it should be situated under the roof of the principal residence of the proprietor, round which his estate mostly lies. Where much land lies detached, a secondary office should be provided. And it may be laid down as a rule, in the management of landed property, that every distinct part of an extensive estate ought to have a place upon it, however humble, in which the possessor may pass a few days, to diffuse over it a spirit of good order and emulation. He has known the most neglected, and almost savage spot, reclaimed, and put in a train of improvement, by this easy method. And hence the utility of consolidating landed property, and throwing it into compact bodies; so that due attention may be conveniently paid to every part.

It is suggested that a *principal office* should have a commodious business room; a small anti-room, lobby, or waiting room; and a safe, keep, or strong room, for the more valuable documents.

Concerning the kinds of furniture, with which an office of this sort should be supplied, they are,

1. General maps of the distinct parts of the estate, or of the different officinaries, or districts, into which the more connected parts may be divided,—coloured so as to shew, distinctly, each farm, or the lands that are eventually intended to be laid into separate farms,—with the woodlands, waters, &c. &c. in hand. And also separate pocket-maps of the several farms, or intended farms; exhibiting, at one view, the outlines, the names, and the contents, of the dif-

ferent fields or pieces of land of which they are severally composed,—and coloured agreeably to their occupancy; so that the several fields of the existing farms, (or intermixed parts of farms, intended to be united,) though scattered, may be readily perceived. If separate columns of contents be endorsed on the backs of the maps, one of them of the intended farm, the others of the existing farms, or parts of farms, with their several totals subjoined, all the doubts and perplexity which are wont to arise on large estates, from the intermixture of farm lands, will, he thinks, be avoided. See MAP.

2. The rentals and books of accounts.

3. Books of valuation; or 'field books;' namely, registers of the number, name, admeasurement, and estimated value of each field, and every parcel of land, as well as of each cottage, or other building, not being part of a farmstead, on the several distinct parts or districts of the estate.—The valuations being inserted in columns; as they arise whether by general surveys, or incidentally; headed with the names of their respected valuers; so that whenever a farm is to be re-let, these columns may be consulted, and its real value be fixed, in a re-survey, with the greater exactness.

4. A general register of timber trees, growing on the several divisions of the estate; specifying the number in each wood, grove, hedge-row, and area;—with the species, number, and measurement, of each tree. Also separate pocket books, containing those of each division; for the occasional use of the manager and the wood-reeve.

5. A receptacle of ordinary papers,—such as contracts, agreements, accounts, letters of business, &c.—intelligibly endorsed, dated or numbered, and arranged so as to be easily referred to. With a book of abstracts, or heads, of papers of great importance, to be referred to on ordinary occasions, and likewise to serve as an index to the originals, which require a more secure repository than a common business room.

6. A safe repository of documents; as title deeds, legal decisions, awards of arbitration, counterparts of leases, passed accounts, &c. The most secure keep of important papers, is a small room, strongly arched over; having an iron door, opening into the office with a window shutter, also of iron: thus guarding the contents, on every side, from fire; the repository of writings being insulated; in the centre of the room. And a standing regulation, respecting papers, whether they may be lodged in the office, or the strong room, ought to be,—that no person be suffered to carry away a valuable paper, on any occasion, without leaving in its place a receipt or memorandum, signifying by whom it was taken, and for what purpose; in order that it may be the more easily traced, in case it should not be returned.

It is advised, that from these maps, books, and papers, from general surveys, and incidental occurrences, are to be formed pocket registers of the farms; corresponding, in number and size, with the portable books of maps. One folio, or two opposite pages being appropriated to each farm; so as to shew, at one view, the name of the farm and its number of acres. The name of the tenant and the existing rent. The tenancy; and, if on lease, the term of expiry. Any extraordinary covenant of the lease. The number of cottages let with the farm.

_____ The number of timber trees growing upon it.

_____ orchard trees growing upon it.

_____ Also, the eligibility of the plan of the farm.

_____ the occupier of the farm.

_____ the present rent of the farm.

_____ The state of the buildings.

_____ the fences and gates.

The state of the roads and water-courses.

— cultivation and live stock.

Likewise the repairs, more immediately wanted.

The improvements of which it is capable.

Together with short notices or abstracts of—

The agreements entered into with the tenant.

The permissions granted him; and

The injunctions delivered to him. With any other inci-

dent or occurrence respecting the farm or its occupier, that requires to be remembered: and with references to the books and papers which may pertain to the several particulars: thus having, at one view, a complete abstract of the history, and present state, of every farm; together with the particulars of attention which each will require. The trouble of forming an abstract of this kind, or of renewing it, when filled, or in order to adapt it to the varying circumstances of the several farms, is inconsiderable, compared with its uses: which are not only obvious to theory, but are fully established in practice. On returning to an estate, after twelve months absence, he has generally found, that, by consulting a register of this sort, and, through its means, making systematic enquiries, respecting the incidents that have occurred on the several farms, during his absence, he has in this summary way, and before he entered upon a fresh view, became better acquainted, not only with the general interests, but with the more ordinary business, of the state, than the acting manager, who had constantly resided upon it, without such a remembrancer: which ought not to comprehend tenanted farms, only; but should comprise woodlands, quarries, the demesne, &c. in hand, as well as the more important improvements going on: each of which ought to have its separate folio assigned it. It is stated that to a proprietor, or his confidential, who only goes over his estate occasionally, such an intelligent companion is essentially serviceable. He cannot profitably direct, nor safely advise with, an acting manager, or other agent, or officer of the estate, until he has consulted so infallible an oracle. And the utility of such a register, while a proprietor is absent from his estate, if he can be said to be so, with such a faithful mirror in his possession, is too obvious to require explanation.

It is also recommended, that besides those written documents and registers, the office rooms of an estate should be furnished with the mechanic instruments that are useful in its improvement and management: as earth borers, to search for useful fossils, &c. &c.; levelling instruments, for laying out roads and water-courses, &c. &c. &c. Also models and drawings of draining mills, floodgates, farmsteads, buildings, implements, &c. &c. &c.

It is concluded that there are men who are losing hundreds or perhaps thousands annually by neglect or mistaken frugality in the management of their estates, yet who will consider this executive establishment, and these forms and regulations of business, as unnecessary and extravagant. Yet where the estates are very large, there can be no doubt these establishments and regulations must facilitate the management of them in a very considerable degree, and of course be of essential advantage to those who are the proprietors of them.

OFFICER, a person possessed of a post or office.

Great OFFICERS of the Crown, or State, are the lord high-steward, the lord chancellor, the lord high-treasurer, the lord president of the council, the lord privy-seal, the lord great chamberlain, the lord high constable, the earl marshal, and lord high admiral. See CHANCELLOR, TREASURER, MARSHAL, &c.

OFFICERS of Justice, are those who are entrusted with the administration of equity and justice in the courts thereof.

OFFICERS, *Royal*, are those who administer justice in the king's name; as the judges, &c. See JUDGE.

OFFICERS, *Subaltern*, are those who administer justice in the name of subjects. Such are those who act under the earl marshal, admiral, &c.

OFFICERS of Police, are those in whom the government and direction of the affairs of a community are invested. Such are mayors, sheriffs, &c.

OFFICERS of War, are those who have command in the forces.

These are either *general*, *field*, or *subaltern* officers.

OFFICERS, *General*. See GENERAL OFFICERS.

OFFICERS, *Field*, are such as have command over a whole regiment; such as the colonel, lieutenant-colonel, and major.

OFFICERS, *Subaltern*. See SUBALTERN.

OFFICERS, *Commission*, are such as are appointed by the king's commission.

Such are all from the general to the cornet and ensign, inclusive.

They are thus called in contradistinction to *non-commissioned* officers, as serjeant-majors, quarter-master-serjeants, serjeants, corporals, drum and fife-majors, who are nominated by their respective captains, and appointed by the commanding officers of regiments, and by them reduced without a court martial.

OFFICERS, *Staff*, are the quarter-master-general, and the adjutant-general, who are strictly said to exist only in time of war: also, the quarter-masters, adjutants, surgeons, and chaplains of regiments.

OFFICERS, *Warrant*, are those who have no commissions, but only warrants from such boards or persons as are authorized by the king to grant them.

OFFICERS, *Sea*, or *officers of the marine*, are those who have command in ships of war.

OFFICERS, *Flag*. See FLAG.

OFFICERS of the Household, are the lord steward, treasurer of the household, comptroller, cofferer, master, clerks of the green-cloth, &c. the lord chamberlain, vice-chamberlain, gentlemen of the privy and bed-chamber, gentlemen ushers, grooms, pages, master of the wardrobe, of the ceremonies, &c. the master of the horse, avenor, equerries, surveyors, &c. See HOUSEHOLD. See also each officer in his proper article.

OFFICERS, *Staff*, are such as in the king's presence bear a white staff; and at other times, going abroad, have a white staff borne before them by a footman bare-headed. Such are the lord steward, lord chamberlain, lord treasurer, &c.

The white staff is taken for a commission; and at the death of the king, the officers break their staff over the hearse made for the king's body, and thereby discharge their inferior officers.

OFFICERS, *Municipal*. See MUNICIPAL.

OFFICERS, *Reformed*. See REFORMED.

OFFICERS of the Mint. See MINT.

OFFICERS, *Signals for*. See SIGNAL.

OFFICIAL, OFFICIALIS, in *Canon Law*, the bishop's deputy or lieutenant; or an ecclesiastical judge appointed by a bishop, chapter, abbot, &c. with charge of the spiritual jurisdiction thereof.

Of these there are two kinds: the one, as it were, vicar-general, of the church, exercising jurisdiction throughout the whole diocese, called by the canonists *officialis principalis*, in our statute law the bishop's chancellor.

There is no appeal from this court to the bishop; his being esteemed the bishop's court.

The other, called *officialis foraneus*, as having his jurisdiction *foris*, & *extra civitatem*, is appointed by the bishop when the diocese is very large; having a certain extent of territory assigned him, wherein he resides.

This official has but a limited jurisdiction, though he have *universitatem causarum*, and exercise it in the bishop's name. Our statute-law calls him *commissary*.

The bishops, especially those of large sees, finding themselves oppressed with a multiplicity of business, at first, discharged a part of it upon their archdeacons and priests, to whom they gave commissions revocable at pleasure. These are called *vicarii*, or *officiales*.

As we do not meet with this term any where before the constitutions of the *sextus decretalium*, it is pretty apparent the custom had not its rise till the end of the thirteenth century.

In process of time the function was divided into two; and the title official given to him with whom the bishop entrusted the exercise of litigious justice; and that of vicars general, or grand vicars, to those who had the voluntary jurisdiction.

The number of officials was soon excessively multiplied; and not only bishops, but chapters and archdeacons, would have their officials.

The officials, by degrees, had drawn to their cognizance and jurisdiction most of the civil causes; till they were taken out of their hands by appeals, &c.

OFFICIAL is also used, in our laws, for a deputy appointed by an archdeacon, for the executing of his jurisdiction: and he standeth in the same relation to the archdeacon as the chancellor doth to the bishop.

OFFICIALTY, the court or jurisdiction of which an official is head.

The practice of officialities is now reduced into a little compass; and actions of promises, and dissolutions of marriages, are the principal things transacted therein.

OFFICIARIIS *non faciendis, vel amovendis*, a writ directed to the magistrates of a corporation, requiring them not to make such a man an officer, or to put one out of the office he hath, until enquiry is made of his manners, &c.

OFFICINAL, formed of *officina*, a shop, in *Pharmacy*, a term applied to such medicines, whether simple or compound, as are required to be constantly kept in readiness in the apothecaries' shops, to be mixed up in extemporaneous prescriptions.

The *official simples* are appointed, among us, by the College of Physicians; and the manner of making the compositions is directed in their Dispensatory.

OFFICIO, *Suspensio ab*. See SUSPENSION.

OFFICIO, *Ex*. See EX OFFICIO, INFORMATION, and OATH.

OFFICIO, *Quod clerici non eligantur in*. See QUOD.

OFFIDA, in *Geography*, a town of Italy, in the marquisate of Ancona; 42 miles S.E. of Ancona.

OFFING, or OFFIN, in the *Sea Language*, that part of the sea that is at a good distance from shore; where there is deep water, and no need of a pilot to conduct the ship into port.

If a ship from shore be seen sailing out to seaward, they say she stands for the offing. And if a ship having the shore near her, have another a good way without her, or towards the sea, they say, that ship is in the offing.

OFFOLANKA, in *Geography*, one of the smaller Friendly islands. S. lat. 19° 35'. E. long. 185° 31'.

OFFRA, a town of Africa, on the Slave coast, where the English and Dutch have a factory; 3 miles S.W. of Jahim.

OFFRANVILLE, a town of France, in the department of the Lower Seine, and chief place of a canton, in the district of Dieppe; 3 miles S. of Dieppe. The place contains 1520, and the canton 13,286 inhabitants, on a territory of 190 kilometres, in 34 communes.

OFF-RECKONING, in *Military Language*. See RECKONING.

OFF-SET, in *Gardening*, a sort of sucker, or small young plant, issuing from the sides of the main root of different sorts of perennial plants, whether bulbous, tuberous, or fibrous-rooted, by means of which they are often readily increased.

The method of increasing by off-sets is applicable, in general, to all sorts of bulbous and tuberous-rooted perennial plants, such as tulips, anemones, &c. in which there are small bulbs, or tubers, that on being planted out afford plants of exactly the same kind as those from which they are taken, and which, after having one or two years' growth, flower, produce seed, and furnish a supply of off-sets in their turn.

In the vast tribe of fibrous-rooted perennial plants, most sorts afford a progeny of this sort, for propagating and perpetuating their respective species and varieties, both in the flowery kind, &c. and in some esculents, but more considerably in the former; by which numerous sorts of the most beautiful flowering perennials are multiplied. Off-sets are, therefore, not only an expeditious and certain method of propagation, but one by which there is a certainty of having the desired sorts continued, whether species or particular varieties.

They have this advantage over seedlings, that the plants of the flowery kind often flower in one year; whereas seedling plants of the bulbous kinds are frequently four, five, and sometimes six or seven years before they flower in perfection. By seedlings new varieties are principally gained, the roots of which furnish off-sets, by which they are increased.

The separating off-sets may be performed in some sorts every year, in others once in two or three years, according to the sorts, and the increase of off-sets afforded by the main roots.

The proper seasons for separating or taking them off, in the bulbous and many tuberous-rooted plants, are chiefly summer and autumn, when they have done flowering, and the leaves are decayed, as at that period the roots of these sorts, having had their full growth, assume an inactive state, drawing little nourishment from the earth for a few weeks. It is also the only proper period for moving all the bulbous kinds in particular, both to separate off-sets and transplant the main roots, or to take them up for keeping a while. See BULB.

The roots should be taken up in dry weather, if possible, and all the off-sets separated singly from the main bulb, &c. planting them in nursery-beds, in rows six inches asunder, by dibble, or in drills two or three inches deep, or in any other method that may be suitable. They should remain a year or two, according to their size, in this situation to get strength; then be transplanted, at the proper season, where they are to continue, managing them as other bulbous and tuberous-rooted plants. See BULB and TUBER.

And the off-sets of fibrous-rooted perennial plants, may either be slipped off from the sides of the main roots as they stand in the ground, or the roots may be wholly taken up, and parted into as many slips as there are off-sets properly furnished with fibres. In this sort, the proper season is the autumn, when their stalks decay, or early in the spring, before new ones begin to shoot forth; though some hardy sorts

forts may be slipped any time in open weather, from the autumn to the early spring, and others almost any time when they occur; planting them by dibble, the smaller ones in nursery-beds, in rows six or eight inches asunder, to have a year's growth; and the larger ones at once where they are to remain.

But in several forts of under-shrubby perennial plants that are capable of being increased by off-sets from the bottoms, the proper season for taking them off is the autumn and spring, or in the hardy kinds any time in open weather, during the autumn or early spring, planting them in nursery-rows for a year or two, or till of proper size for the purposes they are designed for.

The off-sets of succulent plants should generally be slipped off in summer, and, previous to planting those of the tender kinds, be laid on a dry shelf for some days, till the moisture at bottom is dried up; then planted in pots of dry soil, and managed according to their different kinds and habits of growth. See **SUCCULENT PLANTS**.

Off-sets are never produced from annual plants of any kind.

But the particular management that is requisite in the different kinds is more fully explained under the culture of the plant to which it belongs.

OFF-SETS, in *Surveying*, are perpendiculars let fall, and measured from the stationary lines, to the hedge, fence, or extremity of the inclosure.

OFF-SET Staff, a rod, or staff, of any convenient length; for instance, of ten links of the chain.

This staff is divided into ten equal parts. Its use is for the ready measuring the distances from the station line of things proper to be represented in a plan. See **CHAIN**.

OFF-TRACING. See **CALQUING**, **COUNTER-DRAWING**, **DESIGNING**, and **PENTAGRAPH**.

OFF-WARD, in the *Sea Language*, the same with contrary to the shore: thus they say, *the ship heels off-ward*, when, being aground, she heels towards the water-side; *the ship lies with her stern to the off-ward*, and *the head to the shore-ward*, when her stern is towards the sea, and head to the shore.

OFVANAKER, in *Geography*, a town of Sweden, in the province of Helsingland; 37 miles W. of Soderhamn.

OFVERBY, a town of Sweden, in West Bothnia; 32 miles N.W. of Pitea.

OGBUCKTOE, a settlement on the E. coast of Labrador. N. lat. 55° 55'. W. long. 60°.

OGDEN, SAMUEL, in *Biography*, a learned divine of the church of England, was born at Manchester in 1716. Having been instructed in grammar-learning at the free-school in his native town, he was entered of King's college, in the university of Cambridge, from which house he removed to St. John's college in the year 1736. He took his degree of B. A. in 1738, and in the following year was elected fellow of his college. In 1740 he received deacon's orders; and soon after was admitted to the degree of M. A. and ordained priest. Three years after this he was elected master of the free-school at Halifax in Yorkshire, which he retained till the year 1753, when he went to reside at the university of Cambridge. At the first Commencement, after his return, he took the degree of doctor of divinity; and on that occasion recommended himself so strongly to the duke of Newcastle, who was chancellor of the university, by the exercise which he performed, that his grace presented him to the vicarage of Damerham in Wiltshire. In 1764 he was appointed Woodwardian professor, and in 1766 was presented to the rectory of Lawford in Essex, and also to that of Stansfield in Suffolk. Dr. Ogden had acquired

great celebrity in the university by the popularity of his preaching, and in 1770 he published a volume of "Sermons on the Efficacy of Prayer and Intercession; which being very favourably received, he printed, in 1776, another volume on the ten commandments, to which, in the following year, he added a second, "On the Articles of the Christian Faith." He died in the year 1778, in the sixty-second year of his age. His sermons are short, animated, and striking. Sometimes the author rises to the sublime, and sometimes he is distinguished by beautiful strokes of pathos. His method is desultory; his reasoning is not always perspicuous; and his style, though correct and clear, is too concise and abrupt to be recommended as a model of good composition on general subjects. In the year 1780, Dr. Halifax published a new edition of his sermons in two volumes octavo, with a memoir prefixed, to which the reader is referred for further particulars.

OGEE, or **OG**, in *Architecture*, a moulding, consisting of two members, the one concave, the other convex, the same with what is otherwise called *cymatium*.

Vitruvius makes each member of the ogee a quadrant of a circle; Scamozzi, and some others, make them somewhat flatter, and strike them from two equilateral triangles.

The figure of the ogee bears some resemblance to that of an S.

OGEE, in *Gunnery*, an ornamental moulding in the shape of an S, used in guns, mortars, and howitzers.

OGEECHEE, in *Geography*, a river of America, in Georgia; 18 miles S. of Savannah river, the courses of which rivers are parallel to each other. It rises near the Appalachian mountains, and discharges itself into the sea, opposite to the N. end of Oflaban island; 18 miles S. of Savannah.

OGELSTRÖMEN, a river of Sweden, which rises in the mountains bordering on Norway, and runs into the Angermann, near Liden.

OGENDOW, a town of the Birman empire; 10 miles S.W. of Pegongmew.

OGERSKOL, a town of Russia, in the government of Perm; 52 miles W. of Perm.

OGESIMA, a small island of Japan, in the strait between Nippon and Xicoco.

OGGIANO, a town of Italy, in the department of the Lario; 11 miles E.S.E. of Como.

OGHAM, or **OGUM** *Characters*, among the Irish antiquaries, are certain characters found on monuments, and on old writings of a cryptographic, or stenographic nature: these antiquaries contend that their origin is very remote, and that their existence proves the justice of the claim which the Irish make to the use of letters at a period long antecedent to that when they were first introduced into the other Western nations of Europe. In giving an account and description of the Oghams, therefore, it is proposed to comprehend a short discussion on this important point of antiquarian research, which, if we are not mistaken, will lower the claims of the Irish to the level of justice, truth, and common sense. Coolness and sobriety of judgment are of the first importance and necessity in every antiquarian investigation, but they are most indispensably necessary, where objects of Celtic antiquarianism are involved.

According to the most accurate and best informed writers on the subject of Irish characters, there were three kinds of Ogums; first, *Ogum beith*, where *bb*, or the Irish letter *beith*, the first consonant, is used instead of the vowel *a*. To this *Ogum*, the name of *Ogum consoine* is given.

Harris,

Harris, in his edition of sir J. Ware's Antiquities of Ireland, gives the following example of it.

a e i o u
b b f c n g d l f t

Sometimes consonants were substituted for diphthongs, as in the following example :

a e i o i
m m l l u a b b c c p p

The second kind was called Oghum coll, or the Oghum formed out of the letter *c*, to which the name of *coll* is given in the Bethluishnion alphabet : in this kind of Oghum the letter *c* is substituted for all the vowels, diphthongs, and triphthongs, repeated, doubled, and turned in various ways. The following are examples of this species of Oghum :

a e i o u
c c c c c c c c c c
c a i a o i i o u a
c c c c c c c c c c

Before proceeding to the consideration of the third kind of Oghum, it may be proper to offer a few remarks on the two species which have been just described.

It is sufficiently obvious that their antiquity cannot be great ; and that the use of them was by no means confined to the Irish nation, even at the earliest period to which it can be traced. We are informed by Suetonius, in his "Life of Julius Cæsar," and by Dio, that that emperor, when he wrote to any one what he wished to be kept secret, always employed the fourth letter after that which he ought to have used ; as *d* for *a*, *e* for *b*, &c. ; and Suetonius and Isidorus relate that Augustus had also a cypher which he employed in his writings, when he wished them to be kept secret, using the letter following that which he ought to have employed, as *b* for *a*, and *c* for *b* : sometimes he varied his cypher ; for the letter *z*, he used *aa*. Indeed this cypher mode of writing, to which the two species of the Irish Ogums, which we have described, evidently belong, was not only well known to the Greeks and Romans, but was employed by them in various forms, and reduced to a clear and regular system. The ancient notes or cyphers were comprehended under three heads : 1. The hieroglyphical, where the object to be understood was expressed by a symbol, as where a circle was put to express the sun. 2. The Tironian notes, which were so called from Tiro, the freedman of Cicero ; in these a cypher or character had the power of many letters. These are of great antiquity ; they appear to have been borrowed by Ennius from Eastern and Greek archetypes, to have been greatly augmented, and used with great skill by Tiro, and finally to have been digested and reduced into a regular system by Seneca. 3. Sigla, or literary signs ; these were merely verbal contractions, which are found on marbles, coins, and medals. The Roman laws and proceedings were contained in these sigla ; and, as some antiquaries are of opinion, also in the second sort of cypher. Cicero certainly states that the forms of process in the Roman law were written in secret marks (notis) ; and this expression points out rather the second than the third species of cypher. So much intricacy and obscurity had arisen from the use of these cryptogamic characters, that Tribonianus, who compiled the Justinian code, was frequently at a loss to discover their meaning ; and in A. D. 533, their use was forbidden by an imperial edict.

Cyphers of one or other of these kinds were used wherever

a Roman station or colony was planted ; and they were soon adopted by the barbarous nations whom the Romans had subdued. These nations, or rather their priests, to whom alone, at this period, the knowledge of letters was confined, not only adopted the general mode of the Romans, of substituting one character for another, and thus forming a cryptographic alphabet, but they also mixed Roman notes and characters with their original alphabets : hence we find in the seventh, eighth, and subsequent centuries, so many alphabets among the Gothic and Celtic tribes, uncouth in their figure, confused in their order, and barbarous in their name. There is sufficient evidence to prove that among the principal nations of both these tribes, their respective primitive alphabets were employed for supposed magical purposes ; that a knowledge of the power and ascribed virtue of the letters, of which it was formed, was confined to a certain order of men, by whom it was employed for these purposes ; and that this order of men, after the common alphabet, by the progress of knowledge, would no longer serve these purposes, again clothed it in mystery by the intermixture of characters borrowed from their Roman conquerors.

Cryptographic modes of writing, exactly similar to the two species of Irish Ogums which have been described, were practised in all the northern countries of Europe. In the Icelandic Edda at Upsal, is an example of the first species of Oghum, or the Oghum consoine, where, instead of the vowel, the consonant which follows next in the alphabet is placed, as

"Dfxtfrt scrkptprks bfnfdkth skt pmnkbxs hprks."

Here, instead of *a, e, i, o, u, y*, the consonants *b, f, k, p, r*, and *z* are placed, so that it reads thus ;

"Dextera scriptoris benedicta fit omnibus horis."

A similar cypher was used by the Anglo-Saxons.

In these two species of Ogums, therefore, there is no trace either of antiquity or peculiarity : the third species will require a more detailed consideration.

This third sort is the Oghum *croabb*, or the virgular Oghum, which is thus described by Mr. Asple, in his "Origin of Writing," page 179, 2d edition. "It was composed of certain lines or marks, which derive their power from their situation or position, as they stand in relation to one principal line, over or under which they are placed, or through which they are drawn ; the principal line is horizontal, and serves for a rule or guide, whose upper part is called the left, and the under side the right ; above, under, and through which line, the characters or marks are drawn, which stand in the place of vowels, consonants, diphthongs, and triphthongs." In a specimen which he gives of Ogham writing of this kind, taken from J. Ware's Antiquities of Ireland, the cypher is very simple. The horizontal line is the principal, or master line, as it is called ; and the perpendicular and diagonal lines, above, below, and through the horizontal line, stand for twenty letters, in four divisions of five letters each ; the consonants are represented by the first fifteen, and the vowels by the last five : arbitrary marks are substituted for the diphthongs and the letter Z. Colonel Vallancey, in his Irish grammar, gives a specimen of this kind of Oghum, in which the cypher is different from that given by sir J. Ware, the diagonal lines standing for the vowels.

That, however, there is great uncertainty respecting the cypher of this kind of Oghum, is evident, from the account that colonel Vallancey gives of it in another place. In a paper of this gentleman, in the 7th volume of the Archæologia,

Archæologia, to which we shall afterwards have occasion to advert more at length, he confesses that he had erroneously said that the Ogham characters were marked by certain strokes standing perpendicularly on an horizontal master line; but from ancient MSS. he found that the master line was drawn perpendicular, and the characters marked by strokes perpendicular to it, over the right and left; yet in the same paper he gives another manner of writing the Ogham, in which horizontal strokes are drawn on each side of a perpendicular line. Other writers give specimens of circular Oghams; so that, if the Irish antiquaries are to be credited, these are, 1st, the circular mode of drawing the Ogham; 2d, the Ogham on a horizontal master line with perpendicular strokes; 3d, the Ogham on a perpendicular master line with perpendicular strokes; and 4th, the Ogham on the perpendicular master line with horizontal strokes. Whatever may be the antiquity of this species of cryptographic writing, it is evident that the mode of interpreting it must be very loose and ambiguous, and that no dependence can be placed on the meaning of the inscriptions which are found in it.

But this species of Ogham is represented by the Irish antiquaries, not only as cryptographic, but as stenographic: how little it deserves the latter character, may be easily made obvious; it requires fifteen lines or strokes to express the first five letters of the alphabet, or fifty-one for the eighteen elements of the Irish language. Yet this is the Ogham which colonel Vallancey assures us, in his Irish grammar, "the Irish antiquaries preserved as a piece of the greatest value, and that it was penal for any but the Druids to study or use it."

Sir James Ware is the first author who mentions the Ogham croabh, or virgular Ogham (Antiquities of Ireland, xi. 20.); he says, that he was in possession of a thick MS. written entirely in this Ogham. Keyser mentions, that in his time (1720) the earl of Carnarvon had in his library a MS. on this kind of writing, and Aftle refers to a MS. presented to the British Museum by the late Rev. Dr. Milles, dean of Exeter, president of the Society of Antiquaries at London, which had formerly been in the library of Henry, earl of Clarendon; among the tracts of this MS. volume, there is one entitled "(Anonymi Hiberni) Tractatus de variis apud Hibernos veteres occultis scribendi formulis seu artificijs, Hibernice Oghum dictis." From this tract, Aftle has given a plate of the different kinds of virgular Oghams.

Notwithstanding the direct and positive authority of Sir J. Ware, and the predisposition of colonel Vallancey to give credit to any thing which favours or proves the claims of the Irish to high antiquity, the latter gentleman, for a long time, according to his own confession, concluded, too hastily, that "both Sir James and himself had been imposed upon by modern bards, and that no such characters ever existed in Pagan times." Archæologia, vii. 277.

This Ogham the Irish seanaches or antiquaries represent as the alphabetical character, which was regularly used as such, and not as a cypher, by their Pagan ancestors long before the time of St. Patrick, to whom the introduction of letters into Ireland is generally ascribed. It is rather surprising, therefore, that before it was mentioned and described by Sir James Ware, it should neither have attracted their notice, nor been the object of their researches. McCurtin, a hereditary antiquarian of the county of Clare, who died about the middle of the seventeenth century, asserts in his Irish grammar, that he had met with no less than thirty-two ways of writing this Ogham, "so common and well known (observes Mr. O'Halloran, in his History of Ireland, vol. i. p. 68.) was it even then." But colonel Vallancey is disposed to doubt whether these could be all alphabetical Oghams; and

referring to the plate which Mr. Aftle has given, in his work on the origin and progress of writing, of such Oghams as he had discovered in Irish MS. in Ireland, he gives it as his opinion, that only one is ancient; "some," he adds, "are the inventions of modern bards, but the most are scales of *Profodia*, originally drawn in circles, and from thence formed into right lines, at pleasure, to the number of 150 different scales, as fully described in an ancient MS. in my possession." (Archæologia, vii. 227.) From not attending to this circumstance, the Irish bards fell into the mistake, that the ancient Irish had so many different alphabets. This opinion, however, is directly opposite to that which is maintained by O'Flaherty, who, on the authority of Duaid Fírbífs, whom he characterises as "the only pillar and guardian of Irish antiquities, while he lived; and whose death was an irreparable loss to any further improvement on them," maintains that there were actually different forms of Ogham characters, of this species, to the number of one hundred and fifty; of several of which Duaid Fírbífs was in possession; and of which he wrote an account to O'Flaherty, and "of Croabh Ogham, i. e. virgean characters." O'Flaherty's *Ogygia*, translated by the Rev. James Hely, vol. ii. p. 99.

These various and contradictory accounts respecting the nature of the virgean Ogham, in conjunction with the circumstance, that, if the account of its nature, origin, and use, as given by the Irish antiquaries, had been correct and well founded, it must have been often employed both in MS. and on stones, altars, and cromlechs, yet it could not be traced by the indefatigable zeal and perseverance of colonel Vallancey, certainly would not easily or readily have yielded to a belief in its high antiquity and almost sacred character, in the mind of any person not deeply tinctured with credulity. We have already mentioned, that colonel Vallancey was disposed, at one time, to doubt of the existence of such an Ogham; but the vacillation of his mind, or rather his wish to believe, became apparent in his Irish grammar, where he asks, with a strong emphasis, "shall we doubt the authority of Sir James Ware? shall we disbelieve our eyes, when we behold Ogham inscriptions on many remains of antiquity?" From this passage in his Irish grammar (p. 7.), it might naturally be inferred, that these inscriptions had been seen by colonel Vallancey himself; no such thing; for four pages afterwards, he says, "we are sorry it is not in our power to quote any passages in our Druidic Ogham, *such books having not fallen into our hands*." Now, it can scarcely be maintained that there is no contradiction here, if in the passage first quoted, he meant to assert, that he himself had seen Ogham inscriptions, because in the other passage, he says, *no books* containing the Druidic Ogham had fallen into his hands: for the purpose of giving an example (which he laments he cannot give) the Ogham inscriptions on the remains of antiquity, would have served as well as passages or specimens from Ogham MSS.

As, however, the very high antiquity of the virgean Ogham could not well be proved, unless it were found on some of the Irish monuments or altars, the researches of the Irish antiquarians were directed to them. About the beginning of the eighteenth century, a monument at New Grange, in the county of Meath, a short distance from the river Boyne, was discovered: several of the rude stones which compose it are decorated with a variety of devices, circular, zigzag, and diamond-shaped; many of the stones on each side of the *adel* have similar rude marks upon them, and one of them has spiral zigzags. Soon after the discovery of this monument, the Irish antiquaries proclaimed to the world, that they had found the Ogham characters; but no resemblance to letters or characters can be traced by im-

partial

partial and cool observers; and sir Richard Colt Hoare, in his Journal of a Tour through Ireland, expressly states, that the marks which he observed on many of the stones bore very little resemblance to letters, and a great similarity to the ornaments that he had found in the ancient British urns discovered under the tumuli in Wiltshire (p. 256.); and Mr. Edward Lhwyd, who yielded to no man in zeal for the antiquities of the Celtic tribes, while he united an uncommon degree of coolness and judgment with his antiquarian fondness and knowledge, though he describes the monument at New Grange very particularly, does not even conjecture, that the rude carvings on the stones were letters or Ogham characters.

Colonel Vallancey, in the second volume of his *Collectanea*, gives engravings of two crosses, standing in the church-yard of Castle Dermot, in the county of Kildare, with inscriptions on them, which he regards as specimens of the Ogham characters; these crosses are supposed to bear the date of the tenth century. But it may be remarked, in the first place, that the claim of these inscriptions to the Ogham character is very doubtful; and secondly, even allowing that they are in that character, and of the age assigned to them, the antiquity of this character does not rise nearly up to the period of Irish Paganism; and, therefore, no proof can be grounded on these crosses for the Druidic origin or use of the virgean Ogham; and it is not meant to be denied, that subsequently to the introduction of Christianity, it was employed in Ireland; and probably on monuments in the tenth century, though this sir Richard Colt Hoare is strongly disposed to doubt.

In the Irish grammar of colonel Vallancey, a passage is quoted from an Irish MS. which states, that "Fiacra was mortally wounded at the battle of Caonry, his funeral leacht or stone was erected, and on his tomb was inscribed his Ogham name." (P. 7.) But though this appears sufficient evidence and guide to lead to the discovery of an ancient Ogham inscription (if the monument were still in existence), it does not seem that the tomb of this hero was sought after by any Irish antiquary. At last, about the year 1780, a discovery was made, which satisfied colonel Vallancey, and all true Irish antiquaries, that the virgean Ogham was a regular alphabetical character, and that it existed, and was in general use, long before the coming of St. Patrick into Ireland; having thus, in their opinion, traced back the virgean Ogham to an antiquity higher than the era of the introduction of Christianity into Ireland, they supposed they had advanced a considerable step towards putting it beyond a doubt that its origin was Druidic. This supposed discovery was made by Mr. O'Flanagan, at that time a student of Trinity college, Dublin; we shall give the substance of what he says, in a paper read before the Royal Irish Academy, on the 19th December 1785, respecting the circumstances which led to the discovery; and the interpretations of the inscription which he offers.

Being perfectly acquainted with the various dialects of the Irish language, he amused himself with reading many of the legends both in prose and verse; in one of the latter, ascribed to Ossian, he met with the following passage: "The fierce and mighty Conan was not in the desperate battle of Gabhra; for in May, the preceding year, the dauntless hero was treacherously slain by the Fenni of Fin, at an assembly met to worship the sun: his sepulchral monument was raised in the north-west! His wailing dirge was sung, and his name is inscribed in Ogham characters on a flat stone, on the very black mountain of Callan."

The first object which Mr. O'Flanagan discovered on mount Callan, which is about nine miles from Ennis, was

a Druid altar; but this had not the smallest traces of any characters appearing on it; though it might have been supposed, that here, if any where, the Druidic Ogham would have been engraved. At last his zeal was rewarded; about a mile north-east of the altar, a cottager informed him, that there was a stone, "not unlike a tomb-stone, having strokes engraven thereon, very unlike letters." As Mr. O'Flanagan had neglected to take his grammar with him, he was not thoroughly prepared to collect the entire sense of the inscription; but from the rules in his memory, he decyphered it in the following manner: "Fan licfi ta Conan Colgac cos-fador;" "beneath this stone is Conan the Fierce, the Long-legged." On his return home, and consulting the rules given by colonel Vallancey, in his grammar, for decyphering the Ogham characters, he found the meaning to be "Fan li difica Conan Colgac cos-obnda;" beneath this stone is laid Conan the Fierce, the Nimble-footed. Had Mr. O'Flanagan rested contented with this improved version, he could not have afforded room for entirely disbelieving the existence of Ogham characters on this monument; but anxious to prove that this kind of writing was not only very ancient, but had a wonderful superiority in the comprehensiveness of its meaning, to any set of alphabetical or stenographic characters known, he has afforded grounds for most rational and complete scepticism.

It appears from this gentleman's account, that even with the assistance of the rules contained in colonel Vallancey's Irish grammar, for decyphering the Ogham character, he found some difficulty in making out the meaning of the inscription on this monument; and while he was musing over it, Mr. Burton, a friend who had accompanied him to Callan, "calling to mind that the Phœnicians, from whom the Irish derived their origin, generally write from the right hand to the left, took the letters backwards; i.e. in a contrary direction from that in which we had decyphered them." By this contrivance a second reading was found, which, wonderful to relate, had not only made good sense, and had reference to the same hero, but proved a continuation of the first reading. A common antiquarian would have been content with these two readings; not so Mr. O'Flanagan. On his arrival in Dublin he consulted the book of Ballemote, from which he found there were different scales of the Ogham character, in each of which the number of similar lines, on whatever side drawn, did not exceed five. After having made himself perfectly acquainted with this scale, he again applied to the study of the inscription; when he drew from it no fewer than five different meanings: the first has been already given; the second is, "Na fida nica Conan Colgan cos-obnda;" obscure not the remains of Conan the Fierce, the Nimble-footed: the third is, "Adm bo focc agloc fan oca cifa dil Naf;" long let him lie at ease on the brink of this lake, beneath these hieroglyphics, darling of the Sacred: the fourth is, "Adm bo focc ag loc na foc a cina del fan;" long let him lie at ease on the brink of this lake, who never saw his faithful clan depressed: the fifth and last is, "Almho Coflag dos ta cu os asit a lid cuat;" hail with reverential sorrow the drooping heath around his lamentable tomb. On this inscription, thus decyphered, so very pregnant with meaning, Mr. O'Flanagan makes the following remarks: "When all these various readings are united, there appears a rational beginning, continuation, and conclusion of the same sense. But what is still more remarkable, the number of readings is the limit of the number of lines in the Ogham scale. The whole is in the stile and manner of the ancients, descriptive both of the man and the place; and though the language be very ancient, yet it is equally familiar and easy to such as are well

well versed in the several idioms and dialects of the Irish language."

Before proceeding to offer any remarks on the Callan inscription, and on Mr. O'Flanagan's interpretation of it, we shall give the rules on which he contrived to bring out of it such copiousness of meaning: had these rules been laid down in the Irish grammars, and in treatises on the decyphering of the Ogham character, and had they been illustrated and confirmed by examples of undoubted antiquity, the inscription on the Callan monument, as interpreted by Mr. O'Flanagan, might have been received as a specimen of the Druidic Ogham, and as a proof, not only of the great antiquity, but of the wonderful ingenuity of this mode of writing: but when we shall find that the rules which Mr. O'Flanagan followed in interpreting the inscription were in the highest degree arbitrary, and which, if extended, might have elicited fifty meanings instead of five, and would go to destroy all certainty in language, our doubts respecting the Ogham character will be strengthened, and by no means removed by the Callan inscription.

In order to get the first and second meanings, the inscription must be decyphered from the broad to the narrow end of the stone, or from left to right; the letters F and N being interchanged, whenever they occur, as the sense shall direct: the third and fourth readings are found by taking the two former backwards (here the process is from right to left, commuting the letters F and N as before.) The fifth and last reading is made out "by decyphering the Ogham line from the small to the broad end of the stone, changing its position that the process may be from left to right. In this, neither of the letters F or N occurs, and therefore it admits of no further readings." The reason which led Mr. O'Flanagan to the commutation of the letters F and N, is equally whimsical and unfounded with every other step in the process of interpreting this inscription. "This commutability of the letters F and N depends on a circumstance peculiar to the Irish alphabet, it having two different arrangements: one of which begins with B, L, N, and is called Beithluifnuin, and the other with B, L, F, and called Beithluisfearn; the latter is peculiar to the Ogham system, but when it is necessary for the construction, it does not totally reject the former, which was the alphabet in common use, until Greek and Roman literature visited this country, and made the Irish arrange their alphabet, as far as it extended, conformable to their own." And in a subsequent page he observes, "obscurity, and to contain much within a narrow compass, was the purposed end and object of the Ogham; for from the construction it contains much within a small space, and is ultimately founded on an alphabet of different characters, which is evident even from the explication of the inscription before us, wherein the letters F and N (which are severally represented by three and five perpendicular strokes below the horizontal master line) are commutable, a property which they have not in any other part of our language; this commutation depending, as has been already observed, on the two different arrangements of the Irish alphabets: and thus it is left to the reader's choice, to which of the two letters F or N, he will apply either of the aforesaid marks, but the sense will always direct him to the proper mode of application." Transactions of the Royal Irish Academy for the year 1787, vol. i. Antiquities, p. 12.

Having thus given a detailed account of the celebrated Callan inscription, of the interpretation which Mr. O'Flanagan has given of it, and of the rules which he has followed in decyphering it, we shall offer a few remarks, which, if

we are not mistaken, will not only go far to disprove the existence of an Ogham inscription on this monument, or, granting its existence, the accuracy of the interpretation put upon it; but also the claim of the Ogham character or alphabet to Druidic invention or antiquity.

In the first place, Dr. Ledwich, in his Antiquities of Ireland, very pertinently and fairly asks, "Can it be imagined that the Callan inscription has stood almost 1500 years (for the death of Conan is said to have happened in the year 295), in a naked and wild situation, uninjured by the tooth of time, and all the vicissitudes of a variable climate? That the great Atlantic ocean, and its briny atmosphere, have had no influence on this rock, and so far from pulverising its surface, have rendered it useful for vegetation?" (P. 341.) Mr. O'Flanagan, indeed, in a note to his paper (p. 14.), informs us, that from the hard texture of the stone the inscription is perfectly legible; but in another place he says, that the stones of this monument are of the same kind as those of the Druidic altar, and those he expressly describes as "gritty," certainly not a kind of stone likely to preserve entire the inscription on its surface. It should also be recollected, that a single erasure of one of the cyphers, or even of part of one of the cyphers, would have been sufficient to destroy, or essentially to alter, the meaning of any Ogham inscription.

In the second place, two engravings are given of the Callan inscription, both by Mr. O'Flanagan; one in the seventh volume of the Archæologia, p. 281; and the other in the first volume of the Transactions of the Irish Academy (Antiquities, p. 16.) Now whoever will compare, even in a cursory and superficial manner, these two engravings, will find that they materially differ.

In the third place, Mr. O'Flanagan in his paper in the Irish Transactions, as has been already noticed, says, that his first reading, "Fan licli ta Conan Colgac cos-fada," was made out before he had an opportunity of consulting colonel Vallancey's grammar, and that it was afterwards found to be erroneous; whereas, in his letters to that gentleman, published in the seventh volume of the Archæologia, he expressly says, "by the rules given for the Ogham croab in M'Curtin's dictionary, and your grammar, I decypher this inscription in the following manner," i. e. exactly in the manner which in his paper in the Irish Transactions he declares to be erroneous, and to have been the result of his decyphering it from memory.

In the fourth place, though a general remark has been already offered on the very arbitrary and unfounded rules, by which Mr. O'Flanagan proceeded in the interpretation of the inscription, yet a more detailed examination of them may be proper. Mr. O'Flanagan confesses that "the discovery of the true sense of the inscription was principally owing to the ingenious thought of Mr. Burton, with respect to the reading backward; which, whether it affects the ancient literary system of this country or not, at least was instrumental in exciting me to the search, which I should otherwise have been apt to neglect; for finding one sensible reading, it is probable I should not have thought of tracing it farther than the rules in our grammars might direct, and those I find are totally insufficient." (Irish Transactions, Antiquities, p. 16.) Here is a full and complete acknowledgment, that his mode of interpreting the inscription was entirely arbitrary; and as the rules laid down in the grammars for the interpretation of the virgean Ogham, must be supposed to have been drawn from all the known varieties of this mode of writing, Mr. O'Flanagan's method must be regarded, not only as arbitrary, but as utterly unfounded

and unsupported. It is even destitute of any support which might be derived from the supposed Phœnician origin of the Irish nation; for though this circumstance, if well established, might render it highly probable that the Irish would imitate their ancestors in writing from the right-hand to the left, it could never justify the conclusion, that because the Phœnicians wrote in this manner, therefore the Irish, in the third century, both retained this mode, and followed the western mode of writing from the left-hand to the right.

Mr. O'Flanagan appears to have been suspicious of the soundness of the opinion suggested by his friend Mr. Burton; and therefore applied to Mr. O'Connor, an "antiquarian of credit," who decides very peremptorily on the subject.

"That the Milesian family," says he, "imported letters into Ireland, and that their ancestors learned them from the Phœnicians, I am certain; and Mr. Burton judged well in averring that our earliest scribes wrote from the right-hand to the left, but they changed to the more commodious manner of writing from the left to the right, and laid aside the uncouth crooked character of the Phœnicians, when the beautiful Greek and Roman characters were made known here in the fourth and fifth centuries." P. 15.

On the Milesian origin of the Irish nation, and on the Phœnician origin of the Milesians, it is not here necessary to say any thing; but on the other positions, or rather assertions, of Mr. O'Connor, a few remarks may be offered. He asserts that the earliest Irish scribes wrote from the right-hand to the left: in proof and defence of this assertion he does not offer a single argument or authority; and indeed that would have been impossible, for all the Irish MSS. are written from the left-hand to the right, and there is not the smallest trace of any evidence that they ever wrote in any other manner. It can hardly be expected, therefore, by the most warm admirer of Mr. O'Connor's antiquarian knowledge, that his bare and unsupported assertion should be admitted against all other evidence on this subject. But Mr. O'Connor, in his zeal to make out his point, unfortunately proves too much; according to him, the Irish scribes changed to the more commodious mode of writing from the left to the right, at the same time that they adopted the beautiful Greek and Roman characters, *i. e.* "in the fourth and fifth centuries." But if this new mode of writing was not adopted till the fourth or fifth centuries, what becomes of the genuineness of the inscription on the monument of Conan, who is said to have been buried A.D. 295. Mr. O'Flanagan cannot surely expect that all his modes of reading and interpreting the inscription should be allowed him, if he agrees with Mr. O'Connor that the earliest scribes wrote from the right to the left-hand, and that the other mode was not brought into use till the fourth and fifth centuries; he must either give up the genuineness of the inscription, or two of his modes of reading it. If, on the other hand, he adheres to the general opinion, and to the evidence of all MS. and other inscriptions, that the usual mode of writing was from the left to the right, he must lose the advantage of the third and fourth readings; and, consequently, the comprehensiveness of the inscription which he so much admires will be considerably curtailed, and the observation which he makes, that "the number of readings is the limit of the number of lines in the Ogham scale," will fall to the ground. It may be remarked also, that in order to get out the fifth and last reading, he is obliged to have recourse to another unauthorized and arbitrary mode of proceeding: instead of decyphering the Ogham

line from the broad to the narrow end of the stone, he decyphers it from the small to the broad end; but as this, if no other contrivance were also used, would necessarily only give the reading, found out by reversing the first and second readings, he at the same time changes the position of the stone that the processes may be from left to right; so that by this mode those cyphers which were properly below the horizontal master line, become above it, and *vice versa*; and as the letters represented by the Ogham cyphers depend upon their position above or below this line, he thus gets a new set of letters altogether. Certainly, if these liberties of transposing letters were allowed and used by Irish antiquarians in general, they might make out whatever suited their fancy, or hypothesis from any inscription or MS.: but who could put faith in their interpretation?

Fifthly. Hitherto the remarks which have been offered go more against the interpretation of this inscription, and against its alleged antiquity, than against the claim to Druidic origin, maintained for the Ogham cypher, by the Irish antiquarian. Another plan which Mr. O'Flanagan devised for getting out all the meaning, as he conceived, of this inscription, will offer us very conclusive arguments on this latter point, at the same time that it will still farther prove the arbitrary and unfounded nature of the rules he followed, and the futility of his interpretation.

None of the first four readings would be made out if the letters F and N, wherever they occur, were not commuted; but for this commutation no authority is given: it seems to have been entirely a thought of Mr. O'Flanagan's, in order to make out some meaning from this inscription, or at least, such a meaning as should prove the monument to be that of Conan; for, be it observed, he does not commute them in every case, but only "as the sense shall direct." Can any thing be conceived more loose and unsatisfactory than this? It was, indeed, necessary that Mr. O'Flanagan should limit the rule he himself had laid down; for had the letters F and N been commuted in every instance where they occur in this inscription, the name of Conan would not have been found, either in the first or second readings; and as it does not occur in the third, fourth, or fifth readings, the monument might have been that of any other hero, as well as Conan's. So completely does Mr. O'Flanagan follow his rule of commuting the letters F and N, only as the sense shall direct, that in the word Conan the first *n* is got by retaining that letter, and the second *n*, by commuting the Ogham mark for *f* into that letter.

"This commutability," observes Mr. O'Flanagan, "of the letters F and N, depends on a circumstance peculiar to the Irish alphabet, it having two different arrangements; one of which begins with B, L, N, and is called Beithluifnuin; and the other with B, L, F, and is called Beithluifsearn; the latter is peculiar to the Ogham system, but when it is necessary for the construction, it does not totally reject the former, which was the alphabet in common use, till Greek and Roman literature visited this country, and made the Irish arrange their alphabet, as far as it extended, conformable to their own." This passage, though given before, is quoted again, as it suggests several most important remarks. It is here asserted that the Ogham system, when it is necessary for the construction, does not totally reject the Beithluifnuin alphabet. But why has Mr. O'Flanagan confined the commutability of the alphabets to the letters F and N? Had the arrangement of the two alphabets agreed in the order of all the letters except these, it might have been proper so to confine the commutability; but in the order of several other of the letters, the arrangement is different: but this

circumstance did not suit Mr. O'Flanagan's hypothesis to mention or apply. It may be added, that had the commutability been carried to its legitimate length (allowing it to be well founded), fifty readings instead of five might have been made out of this inscription.

In the passage just quoted, Mr. O'Flanagan states a fact which is completely decisive against the Druidic origin and antiquity of the Ogham cypher; this cypher is arranged according to the alphabet called Beithluisfearn, but does not totally reject the alphabet called Beithluisnuin: now the latter was the alphabet in common use until Greek and Roman literature visited Ireland, when the former alphabet was adopted. It follows, therefore, that the Ogham cypher, having been adapted to an alphabet confessedly posterior in its origin to the introduction of Christianity into Ireland, cannot claim an antiquity greater than that alphabet. Had it been more ancient, it would naturally have been adapted to the more ancient alphabet, though after the introduction of the more modern one, it occasionally, or, in some instances, might have been applied to the latter; but as the direct reverse is the fact, as the Ogham system is radically founded on the modern alphabet, while it only does not reject the ancient one, its date must be considered as contemporary with, at the highest, but more probably posterior to that alphabet, which was introduced into Ireland along with Greek and Roman literature.

The high antiquity, and even the Druidic origin of the Irish Ogham, as well as of their alphabet, is contended for on other grounds besides those which are derived from monumental inscriptions and old MSS. The Druids, it is asserted, had the use of letters from the earliest period, to which we can trace this order of men; and their letters were formed upon the system of symbolical sprigs, which may still be traced in the virgean Ogham, and Beithluisnuin alphabet of the Irish. Of this alphabet, O'Flaherty, in his *Ogygea*, gives a particular description. "Each letter borrowed its appellation from trees." The book of Lucan, upon whose genuineness and authority Irish antiquaries lay great stress, though Mr. Aske affirms it is only 380 years old, and abounds so greatly in fables and absurdities, that an intelligent reader would as soon believe any of the tales related in it, as that the Milesian colony taught the use of letters in Ireland many centuries before the Christian era (p. 121, 122.) gives the following account of the number, order, and name of each letter in the alphabet.

- B. 1. *Beithe*, the birch-tree
- L. 2. *Luis*, commonly *Caerthean*, the wild ash.
- F. 3. *Fearn*, the alder, of which shields are made.
- S. 4. *Sail*, the willow.
- N. 5. *Nion*, vulgarly *Unfionn*, the ash-tree of which spears are made.
- H. 6. *Huath*, vulgarly *See*; white-thorn, or thorny bushes, that grow on hedges.
- D. 7. *Duir*, vulgarly *Cuilcaun*, the scarlet oak, broom, holm, or holly.
- T. 8. *Tinne*. The explanation of this letter is not given.
- C. 9. *Coll*, the hazle.
- Q. 10. *Queirt*, vulgarly *Aboll*, the apple-tree.
- M. 11. *Muin*, vulgarly *Fineambuinn*, the vine-tree.
- G. 12. *Gort*, vulgarly *Fidheann*, the ivy.
- Ng. 13. *Ngedal*, vulgarly *Gilcach*, or *Raid*, the reed.
- P. 14. *Petboc*. There is no explanation of this.
- Z. 15. *Zirais*, vulgarly *Draighean*, the sloe-tree.
- R. 16. *Ruis*, vulgarly *Trom*, the alder-tree.
- A. 17. *Ailm*, vulgarly *Gius*, the fir-tree.
- O. 18. *Onn*, vulgarly *Aiteann*, furze.
- U. 19. *Ur*, vulgarly *Frach*, heath or ling.

E. 20. *Eadhadh*, vulgarly *Cramcriothach*, the aspen-tree.

I. 21. *Idho*, or *Idhad*, vulgarly *Ibhar*, the yew-tree.

Ea. 22. *Ebbadh*, vulgarly *Criothach*, the aspen-tree.

Oi. 23. *Oir*, vulgarly *Feords*; the spindle-tree, or prick-wood.

T. 24. *Uilleann*, vulgarly *Eadhlean*, woodbine, or honey-fuckle.

Io. 25. *Iphin*, vulgarly *Spirian*, or *Ispin*, the gooseberry-tree.

X. 26. *Ambancholl*. The explanation of this letter is not given.

Before proceeding to a direct and formal examination of the Druidic antiquity and origin of this alphabet, one remark may be offered, which, of itself, independently of other proof, is sufficient, in the minds of calm and rational enquirers, to create considerable doubts on this point. It will be observed that the name of the fourth letter in the Beithluisnuin alphabet is *sail*, the willow: he must be a sturdy etymologist, indeed, who will contend that this is a primitive Irish word, and not a derivative, from the Latin *salix*.

But we have a direct and positive evidence that the Druids did not make use of letters, at least for the purposes of religion. Cæsar expressly says, "neque fas esse existimo aut ea litteris mandare; cum in reliquis fere rebus, publicis privatisque rationibus, Græcis literis utantur." The word *Græcis* has by many critics been supposed to be an interpolation, but it would appear without sufficient authority. Mr. Aske remarks, "that the ancient Gaulish letters are derived from the Greek, and their writing approaches more nearly to the Gothic than that of the Roman: this appears by the monumental inscription of Gordian, messenger of the Gauls, who suffered martyrdom in the third century, with all his family. These ancient Gaulish characters were generally used by that people before the conquest of Gaul by Cæsar, but after that period the Roman letters were gradually introduced." (P. 57.) The Roman letters appear to have taken place of the Grecian, or Gaulish, in Britain about the time of Tiberius; for on a coin of Canobeline, king of the Cassii and Trinovantes, who flourished in the reign of that emperor, the letters are decidedly Roman. Now, if the Druids had possessed an alphabet of their own, it is to be supposed that it would have been used, and not a foreign alphabet on the coins of the British monarch. When Celsus opposed the antiquity and learning of the Druids to those of the Jews, Origen, in reply, denied that there were any writings of the Druids in existence; a denial he would hardly have made had they been as remarkable for their learning and writings, as the Irish and other Celtic etymologists would have us to suppose.

Nor are the proofs of the primitive nature and high antiquity of the Irish alphabet, drawn from other sources, better founded. One of these proofs is thus stated by Mr. O'Halloran, in his "Introduction to the Study of the History and Antiquities of Ireland," p. 29. "As a new instance of the originality of our characters, we may add that our letters in ancient times were called *Feadha*, alluding to wood: our Ogham, or hieroglyphic character, is to this day called Ogham croabh, or the branchy type, and every letter in our common alphabet alludes to some tree. Our earliest writings were on the tablets of birch-tree, called *Orauin*, and the collected pieces *Taibhle-Fileadh*, or *Philosophical Tablets*. It was to this custom undoubtedly that Horace alluded, when he styled the first composition of laws, engraving them on wood, *leges incidere ligno*." It is scarcely possible to read this proof of the originality of the Irish characters,

without a smile of credulity and contempt: the very terms used to express the collected pieces, are evidently derived from another language, either from the Latin and Greek directly, or from the English; *Taibhle-Fileadh* bears too close a resemblance to philosophical tables, to be regarded as a pure and primitive Irish expression. But independently of this circumstance, what does this pretended proof of the originality of the Irish characters amount to? They were engraven on wood, the terms expressing them had reference to wood, and therefore they were not borrowed. The reverse of the inference would have been more rational and probable; for in the primitive state of most languages, the same was the case; and the Anglo-Saxon language, from which there is good reason to suppose the Irish borrowed their alphabetical characters, had expressions of nearly similar meaning, applied to their alphabet. Indeed in all the northern languages, there is a reference in the word used to express an alphabet, to the custom of cutting the letters on wood. In Icelandic, Runa Stafr is an alphabet; and the word Bog-stav, or Buch-stab, is used in Germany to signify a letter: this is evidently derived from bog, or buch, a beech-tree, and from stav, or stab, a staff or stick.

But on this point, it is needless to add any thing to the opinion and testimony of Mr. Asple, contained in the following passages. "It appears that the Irish have neither written monuments nor coins to prove their pretensions to the use of letters, at so early a period as they contend for. The tables of wood upon which they are said to have written, no author of any authority ever pretended to have seen. But the evidence which we might have expected to have derived from ancient MSS. is defective, indeed; for the oldest Irish manuscript which we have discovered is the psalter of Cashel, written in the latter end of the 10th century." P. 120.

"Mr. Innes, in his "Essay on the Antiquities of Scotland and Ireland," and Mr. James Macpherson, in the third edition of his "Introduction to the History of Great Britain and Ireland," produce incontestible evidence to invalidate the reports of the Irish. These authors contend that Ireland was first peopled from Britain; that the former nation was so far from being the seat of polite learning for many years before the neighbouring nations, or even Greece itself had emerged from ignorance, as hath been pretended, that they were generally deemed, by the most respectable writers of antiquity, to have been less civilized than any of their neighbours: that the manners of the old Irish were inconsistent with the knowledge of letters: that the Ogham was a species of stereography, or writing in cypher; and they thus conclude with decisive proofs against the pretended literature of the ancient Irish. They invalidate the accounts of the emigration of the Milesian colony, and dispute their pretended extraction from any of the nations of Scandinavia. Great stress hath been laid, as appears above, by the advocates for the antiquity of letters among the Irish, that their alphabet differs from all others in name, order, number, and power. These arguments were adopted by those who contended for the antiquity of the Runic letters, which have been confuted. Mr. Innes, in his essay above quoted, p. 446, delivers it as his opinion, that the *Beth*, *Luis*, *Nion*, or alphabet of the Irish, was nothing but an invention of the Irish seanachies, who, after they received the use of letters, put the Latin alphabet into a new arbitrary order, and assigned to each letter the name of some tree; and that this was not a genuine alphabet of the Irish in ancient times, or peculiar to them; but was a bare inversion of the Latin alphabet." P. 122.

"To conclude this head, it is impossible to say whether all which hath been advanced will operate upon the minds

of those of the Irish nation, who are superstitiously devoted to the legendary tales of their ancestors, for it is in vain to oppose rational doubts, arguments, or even facts, to popular credulity; although we may with great reason suppose, that the fictions which the vanity and patriotism of the Irish have been raising for ages, will gain no credit with the sensible and judicious part of mankind, but will vanish before the strong beams of history and criticism: in truth, all scepticism must vanish by an inspection of the 22d plate, wherein we have ocular demonstration that the Erse and Irish characters are the same; and that they are similar to those used by the Saxons in Britain, appears from several Saxon alphabets in the preceding plates; so that those who obstinately persist in asserting that the Irish characters are not derived from the Roman, after what hath been said on this head, must deny the evidence of their senses" P. 138.

But the Irish borrowed not only their regular alphabet, but also one species at least of their Oghams: the consideration of this species, as more nearly allied to alphabetical characters than the virgular Ogham, we have left to the present place; but it will not detain us long. This species was called the *Marcomannic Runes*; an engraving of them is given by Dr. Ledwich in his "Antiquities of Ireland," p. 329. It might have been supposed that both the name and the epithet applied to these characters, would have satisfactorily proved, that the Irish had borrowed them from the northern nation: but Mr. O'Halloran contends that the occult manner of writing employed by the northern nations, to which the name *Runic* was given, was not only of Irish origin, but that the name *Runic* is purely Irish, and cannot be explained in the northern languages. It cannot, indeed, be denied that *run*, in Irish, signifies secrecy, or mystery; but it has the same signification in the northern languages. On this point Dr. Ledwich remarks; "The word and its meaning must have been adopted from the northern, for it could not co-exist in the Teutonic or Gothic, and Celtic, in similar letters and import, unless we assert these tongues to be the same. As all know they were not, then we must have had it from the northern invaders of this isle, and to them is to be attributed the loss of the old Celtic name *Ogham* for that of *Run*, introduced by them. O'Brien, treating of this word, without any design of doing so, confirms the truth of what is asserted, by shewing, that in five dialects of the Teutonic, it is preserved in its original signification." P. 332.

The following circumstance still farther illustrates and confirms the idea, that the Irish term *run* is derived from the Teutonic dialects, and that from the northern nations, the Irish borrowed at least some species of their secret characters. The Runes of the northern nations were supposed, by a particular mode of using them, to be possessed of magical qualities; and the understanding and application of these qualities were confined to the priests and priestesses: of the latter, Keysser gives a very full and curious account (*Antiquitates Septentrionales*, p. 371.), and informs us that they were called *Alirune*; but according to O'Brien (*Irish Dictionary, in voce*) *Alarunaighe*, in the Irish language, is the wise man acquainted with secrets. The Marcomannic Runes, therefore, employed by the Irish, as well as the term *run*, may fairly be considered as of Teutonic origin.

The following are the general conclusions which may be drawn from the authorities and arguments brought forward in this article.

1. That the virgular Ogham cannot have an origin prior to the introduction of Greek and Roman literature into Ireland, since it is adapted to an alphabet, the arrangement of which took place at that time.

2. That

2. That the Irish alphabets bear strong marks of having been borrowed from the Anglo-Saxon inhabitants of England. The alphabet called Bobeloth is regarded as the oldest, and Dr. Ledwich remarks, that "the names and figures of the letters are exactly in the style of the British, Runic, and Marcomannic runes," and this, the plate he has given of it sufficiently proves: the form of the letters in the Bethluisnuin alphabet is still more palpably derivative and modern.

3. That the Irish claim to literature, in very early periods of their history, and especially their claim to Druidic literature, is utterly unfounded.

With respect to the mode of ascertaining the comparative antiquity of MS., written in the virgular Ogham, Mr. Aspley informs us that "Diphthongs are not found in the ancient MSS.: the vowels are written separately, as *a e*, not *æ*, &c. therefore an Ogham or cypher with marks for diphthongs is not ancient." (P. 189.) Mr. Aspley adds, that king Charles I. corresponded with the earl of Glamorgan, when in Ireland, in the Ogham cypher, a specimen of which he gives in his thirty-first plate. Some of this correspondence is preserved among the royal letters in the Harleian library.


Irish etymology is such delicate ground to tread upon, and it offers, in general, so little that is satisfactory, or useful, that we should conclude this article without examining into the derivation of the word *Ogham*, did it not throw light, as we conceive, on a curious, and little understood passage in one of Lucian's dialogues.

It is rather surprising that such an undaunted and sanguine Irish antiquarian and etymologist as colonel Vallancey should assert (Irish Grammar, p. 4.), "that authors are at a loss for the derivation of the word *Ogham*, which is not to be found in any dictionary of the Irish." That it is not to be found in them is very true; and (as has been already remarked) as the word *Run*, even in the oldest MSS., is used to signify secret writing, and not the word *Ogham*, this is a proof that, even in very remote times, the mode and practice of this kind of writing was borrowed by the Irish from the northern nations. But though the word *Ogham* is not to be found in Irish dictionaries, it existed in the old Celtic: it still exists in the kindred dialect of the Welsh; and in both these languages its meaning is certain, and appropriate to its application at present in the Irish language. Keyser (Antiq. Septen. p. 38.) expressly states, "probe noverim, vocabulum *Oga*, Oghum, vel Oghma Celte significasse secreta literarum, vel literas ipfas." And Rowland, in his *Mona Antiqua*, p. 238, says, it is still preserved in the Welsh.

But Mr. O'Flanagan (Irish Transactions, p. 13.) traces its origin and meaning still farther back in the Irish language. The fundamental rules of the Ogham are given in five circles, drawn at certain intervals within each other; a diagram of which, taken from the Book of Ballymote, he gives in page 16. Hence he derives the word *Ogham* from *Oc*, *Ogh*, or *Ogha*, a circle; and he adds, "as the lines of which it is composed evidently refer to an alphabet already existing, by this word (*Ogham*) in our language is understood an obscure character, or an occult manner of writing."

Without laying much stress on this attempt to trace the word *Ogham* still farther back in the Irish language, it seems evident that it is a Celtic term, which formerly existed in this language, though now lost, except in its application to the cyphers which go under that name. O'Halloran, however, in his zeal to prove this point, goes even beyond the common degree of Irish etymological ignorance or rashness, in the following passage, in his Introduction to the Study of the History and Antiquities of Ireland, p. 38. "We have a recent evidence that the word came from Ireland; for

William Halloran, head of the nominals at Orford, the contemporary and great opponent of our Scotus, is better known amongst schoolmen by the name of William of Ocham, and Ogham, than by his real name of O'Halloran; the name of Ogham being given him by his countrymen, on account of his great knowledge in this occult writing, and in which, Ware declares, he was possessed of an entire book wrote in vellum." It is scarcely possible to produce from any author so short a passage, containing so much ignorance and misrepresentation. From the construction of the latter part of it, one would suppose that we had Ware's authority, that William Halloran possessed an entire book of Oghams; whereas the real meaning is, that Ware possessed such a book. Besides, William Halloran was never called William of Ogham; and the epithet of Ocham, or Okeham, applied to this philosopher, might have led Mr. O'Halloran to suspect that this was the name of his birth-place, even had he been ignorant that he was actually born at Okeham in Surrey, and took his appellation, as was usual, from that place. But the honour of his country, and his fondness for Irish etymology and antiquity, especially when aided by an opportunity of celebrating a namesake, and probably an ancestor of his own, seems to have been too strong for Mr. O'Halloran's love of historic accuracy.

Though colonel Vallancey confesses himself ignorant of the Irish derivation of the word *Ogham*, yet, in conformity to his known system of Irish antiquities, he finds no difficulty in tracing it back to an oriental origin. It is derived, according to him, from the Chaldaic or Phœnician , *Ocham*: and though there is much doubt among the rabbis respecting the meaning of this term; some explaining it to mean a chest to keep secret writing in; others, brazen vessels; while others think it is the name of the town; colonel Vallancey positively avers, but without vouchsafing to give reason or authority for his assertion, that "the true and literal meaning of the word is a *court character*, appropriated to the records of the church and state." Archæologia, vii. 284.

But though colonel Vallancey can bring forward only his own assertion for the oriental origin and meaning of the word *Ogham*, there can be little doubt that this, or a very similar word, exists in the eastern language, with exactly the same meaning as it possesses in Irish. Mr. Weston, in a paper in the 14th volume of the Archæologia, p. 246, quotes the authority of sir William Jones, to prove that, in the Sanscrit, the word *agam* means mysterious; and is derived from *gama*, to go, with the *a* prefixed, signifying to go to, to come at, or to acquire the knowledge of.

To apply the remarks which have been offered, respecting the etymology and meaning of the word *Ogham*, to the passage of Lucian, already referred to. Lucian, in his piece, entitled "De Hercule Gallico," edit. Paris, 1615, p. 853, describes the Celtic Hercules; but from his account of him, it is evident that the Gauls viewed and worshipped Hercules exactly in the same light as the Greeks and Romans did Mercury, viz. as the god of eloquence. This, indeed, he says, he was expressly informed by a Celt. But "the Celts," adds Lucian, "call Hercules by a word in their own vernacular tongue, *Ogmian*" (*ογμιος*). Schmidt, in a dissertation in the first volume of the Archæologia, endeavours to prove that *ογμιος* had the same meaning in Celtic as in Greek, and is properly a furrow or boundary. For this he is rudely attacked by Toup, who considers *ογμιος* as a corruption for *ομογμιος*, and that the Hercules of Lucian is *ομογμενος*, or one of the *dii penates*.

As, however, Lucian expressly says that *ογμιος* was a Celtic word, we must look for its meaning in the dialects of that

that language; and as it was applied by the ancient Celts to their god of eloquence, the meaning, in all probability, has reference to the character of this deity. But the word *Ogum* is so similar to it, both in sound and meaning, that little doubt can be entertained that "*Herules Ogmus* (to use the words of Keyser) *non alius fit, quam literatus, doctus, eloquens.*" So far this part of Lucian's writing may be rationally and satisfactorily explained; but the opinion of Campbell and Toland, that, in the description which Lucian gives of the Celtic Hercules, the nature and properties, as well as the name of the Irish alphabet, may be discovered, is too wild and ridiculous to claim a moment's investigation or notice.

OGHAO, in *Geography*, a small island in the South Pacific ocean, west of Annamooka.

OGIDOO, a town of Bengal; 24 miles S.W. of Raimgur.

OGIER, CHARLES, in *Biography*, a man of learning, was born at Paris in 1595. He studied first at Bourges, afterwards at his native city, and then went to Valence to attend lectures in the law, of which faculty he was made a doctor. He followed for some time the profession of an advocate; but becoming disgusted with this employment, he accepted the post of secretary to Claude de Mesmes, count d'Avaux, in his embassy to the northern courts. Ogier accompanied him during his mission in the years 1634 and 1635, and drew up an account of his travels; when the count d'Avaux, finding himself complimented in it, desired him to keep it in MS. for 20 years. It was first published in 1656, under the title of "*Caroli Ogerii Ephemerides five Iter Danicum, Suecicum, Polonicum, cum esset in Comitatu illustro Claudii Memmii, Comitiss Avauxii, ad septentriones Reges extraordinarii Legati.*" This work contains many curious particulars of the manners and customs, the eminent characters, &c. of the countries visited by the author, and likewise of the negotiations of the count d'Avaux. It is interspersed with Latin verses. Ogier died in 1654. He had a brother Francis, an ecclesiastic, who attended the count d'Avaux, when he went to sign the peace of 1648. He was author of poems, sermons, and other works, of which one of the most esteemed was his "*Jugement et Censure de la Doctrine curieuse de Fr. Garasse.*" He died in 1670. Moreri.

OGILBY, JOHN, who had a considerable share in introducing typographical splendour into this country, was born in the year 1600, at or in the vicinity of Edinburgh. His father, who was a branch of an ancient and considerable family, became a prisoner for debt in the king's bench, and was unable to give his son a liberal education: he, therefore, bound himself an apprentice to a dancing-master in London, and was afterwards employed in the family of the earl of Strafford, who appointed him deputy-master of the revels at Dublin, where Ogilby erected a theatre. To his honour it is mentioned, that with the first money which he earned, he freed his parent from prison; an act of filial piety deserving of the highest commendation. By a severe strain in the muscles of his leg, he was obliged to procure some other means for obtaining a livelihood. "It is not worth while," says his biographer, "to pursue the various fortunes of his life, through which he displayed extraordinary industry, a projecting head, with a talent of obtaining patronage in the execution of his projects, and a spirit not to be depressed by misfortunes and reverses." He overcame his want of a literary education, so far as to be able to translate from the Latin and the Greek: hence we have his versions of Homer and Virgil. His Homer, though a very bad translation, had the honour of being a great favourite

with Pope in his childhood, and is thought to have kindled the poetical flame in his breast. The cuts to his translation of Virgil were highly valued, and served for a splendid edition of that poet. He published a magnificent edition of the bible with plates, for which he was remunerated by the house of lords. In 1661 he was appointed to conduct the ceremonies at the king's coronation, of which he published a pompous account in folio, with plates. He had the misfortune to lose his whole property in the great fire of London; after which he obtained the appointment of his majesty's cosmographer and geographic printer, in which capacity he printed some volumes of his great Atlas. He also published an account of Japan; and an account of the great cross-roads of the kingdom, from his own actual survey and mensuration by the wheel, which was for a considerable time a standard work, and passed through many editions. He died in 1676.

OGIVES, or *Og Arches*, in *Architecture*, are arches or branches of a Gothic vault, which, in lieu of being circular, pass diagonally from one angle to another, and form a cross with the other arches which make the side of the squares, whereof the ogives are diagonals.

The middle, where the ogives cut or cross each other, is called the *key*, which is sometimes carved in form of a rose, or a cul de lampe. The members or mouldings of the ogives are called nerves, branches, or reins; and the arches which separate the ogives, double arches.

OGLETHORPE, JAMES, in *Biography*, an English general, born in Westminster about the year 1688, was the son of sir Theophilus Oglethorpe of Godalming in Surrey, who was accused of disaffection in the reign of William and Mary. He entered the army as an ensign in 1710. He afterwards served under prince Eugene, to whom he became secretary and aid-de-camp. On the restoration of peace, he returned home, and obtained a seat in the house of commons, where he was distinguished by his exertions for the benefit of trade, and a reform in the prisons. In 1732 he went to America, settled in Georgia, and erected the town of Savannah. He again visited that country, and made an unsuccessful attempt upon Fort Augustine, the capital of Florida, belonging to the Spaniards. For this he was tried, on his return to England, and acquitted. In 1745 he was promoted to the rank of major-general, and was sent against the rebels, but did not overtake them; on which account, the business was investigated by a court-martial, but the general was honourably acquitted. He died in 1785, at the advanced age of 97, being by many years the oldest general in his majesty's service. Smollet's Continuation, vol. i. and ii. European Mag.

OGLETHORPE, in *Geography*, a county of Georgia, in America, on the north side of Altamaha river, west of Liberty county; containing 9780 inhabitants, of whom 3089 are slaves.

OGLIASTRO, a town of the island of Sicily, in the valley of Mazara; 9 miles S.S.E. of Palermo.

OGLIO, a river of Italy, which rises in the bishopric of Trent, and joins the Po at Bergo Forte.

OGLIO. See **OLIO**.

OGMO, in *Geography*, a town of Lower Siam, on the east side of the gulf. N. lat. 13° 43'. E. long. 101° 48'.

OGMU, a town on the west coast of the island of Leyta. N. lat. 10° 55'. E. long. 124° 30'.

OGNATA, a town of Spain, in Guipuscoa; 3 miles S.W. of Segura.

OGNI, a cluster of five small islands in the Grecian Archipelago, between the island of Scio and the coast of Natolia. N. lat. 38° 33'. E. long. 26° 14'.

OGOA,

OGOA, in *Mythology*, a deity worshipped by the Carians, especially in the city Mylassus. We learn from Pausanias (In Arc.), that the sea, which was thought to pass under the temple of this god, sometimes overflowed it. It is probable, therefore, that Ogoa was the name which the Mylassians gave to the god of the sea.

OGOLETZ, in *Geography*, an island of Russia, in the straits of Vaigatfkoi. N. lat. $69^{\circ} 40'$. E. long. $26^{\circ} 14'$.

OGOR, a river of Russia, which runs into the Duna, 12 miles S.E. of Riga.

OGOROO, one of the smaller Friendly islands; 15 miles N. of Annamooka.

OGOST, a river of European Turkey, which runs into the Danube near Rakova, in Bulgaria.

OGOUA. See **OEGWA**.

OGRAM LOUGH, a lake of the county of Clare, Ireland, the river flowing from which passes through Scarriff to the Shannon. By Dutton and Pelham it is called Lough O'Grady. It is in the north-eastern mountainous district of the county. Beaufort.

OGRAH, a town of Hungary; 15 miles N.N.W. of Presburg.

OGRESSES, or **AGRESSES**, in *Heraldry*. See **PELLETS**.

OGULIN, in *Geography*, a town of Croatia; 32 miles E. of Fiume.

OGYGES, in the *History of the Heroic or Fabulous Age of Greece*, a sovereign of Attica and Bœotia, under whose reign happened the inundation since known by the name of Ogyges's deluge. Whether this prince was a native or a foreigner; at what time he lived; and what was the deluge which happened under his reign, are questions of no very easy solution. The Greek historians tell us, that Ogyges reigned, as we have said, in Attica and Bœotia, while Phoroneus, the son of Inachus, governed Argolis, and that it was in his time the deluge happened which has passed under his name, and the date of which Censorinus fixes about the year 1200 before the Trojan war: but in proof of these facts they cite no authorities. The Parian Marbles say nothing of it, and that famous chronicle begins only with the arrival of Cecrops in Greece. According to Augustine (De Civ. Dei), the deluge of Ogyges happened under Phoroneus, the second king of Argos; and he alleges, that this was the opinion of Eusebius and Jerome. Sir Isaac Newton, who has very much contracted the antiquities of Greece, places the date of this deluge in the year 1045 before our vulgar era. Julius Africanus, on authorities which he has cited, and among others that of Diodorus Siculus, maintains, that Ogyges lived more than 1020 years before the first Olympiad, and consequently nearly 1800 years B.C.; and this date agrees with the opinion of Petavius, who fixes the deluge under that prince's reign to the year 1796 before our vulgar era. St. Jerome contends, that it was not at Attica, as all the ancients allege, but in Egypt that the deluge of Ogyges happened; but as Jerome supposes that prince to have been contemporary with Moses, we may conjecture that this contended deluge was nothing else but the event that happened in the Red sea at the exodus of the Hebrews. Banier thinks it certain, that Ogyges was not a native of Greece; but does not determine whether he was from Egypt or Phœnicia, or from the country of Amalek. He went and settled at Thebes in Bœotia, named frequently by the ancients Ogygian Thebes; and he reigned also over Attica. It was under his reign the inundation happened, which occasioned great desolation in the country, and went by the name of the deluge. The epocha of the deluge is placed by Banier towards the year 1796 B.C., agreeably to the Greek

history, and to the opinion of Petavius and Marsham. In Blair's Table, the reign of Ogyges in Attica is fixed in the year 1796 B.C., and his death in 1764 B.C., when the deluge happened; which deluge is said to have laid waste the country of Attica for 200 years, till the coming of Cecrops.

OGYGIÆ INSULÆ, or *Ogygian Isles*, in *Ancient Geography*, comprehend a certain number of islands near that part of Italy called Brutium, to the east, and opposite to a kind of peninsula, north-east of the Scylacian gulf. They are represented as the territory of the nymph Calypso, and one of them bears her name, as well as that of Ogygia. It is particularly described by Pliny.

OHAMANENO, in *Geography*, a small but good harbour, on the west side of Ulitea, one of the Society islands. The channel leading into it is about a quarter of a mile wide, lying between two low sandy islands, within which is good anchorage in 28 fathoms, and soft ground. S. lat. $16^{\circ} 45'$. W. long. $151^{\circ} 38'$.

OHAMENE HARBOUR, a fine bay on the east side of Otaha, one of the Society islands; which passes in between two small islands, Tochoutu and Whannuaia, forming a good harbour, with 25 to 26 fathoms water.

OHANG JAVA, a group of nine islands in the Pacific ocean, discovered by Taiman, and lying in S. lat. $4^{\circ} 36'$. E. long. $154^{\circ} 17'$. One of these islands is of considerable extent, the other eight are scarcely better than large rocks; but though they are low and flat, they are well covered with wood, and abound with inhabitants. The people are black, and woolly-headed, like the Negroes of Africa. Their weapons are bows and arrows; and they have large canoes, which they navigate with a sail.

OHATOOA, one of the Navigator's islands, probably the same with that called by La Perouse *Ozolova*; which see.

OHERURUA, a harbour on the west coast of the island of Otaha. S. lat. $16^{\circ} 38'$. W. long. $151^{\circ} 30'$.

OHETEROA, an island in the South Pacific ocean, 13 miles in circuit, and rather high than low, but neither populous nor fertile in proportion to the other islands in these seas. The chief produce seemed to be the tree of which they make their weapons, called in their language "Etoa." It was encompassed by Cook and his companions, August 1769; but it had neither harbour nor anchorage about it. The natives, who were fierce and hostile, seemed to be lusty and well made: under their arm-pits they had black marks about as broad as the hand; they had also circles of the same colour, but less broad, round their arms and legs, but no other part of the body was marked. The cloth that formed their dress resembled that of the other islands in its materials, of a bright but deep yellow, covered with a composition like varnish, which was either red or of a dark lead colour: over this were painted stripes of many different patterns, regularly disposed. Their habit was a short jacket of this cloth, reaching about as low as their knees, consisting of one piece, and stitched round with long stitches. It was girt round them in such a manner, that they exhibited a gay and warlike appearance. Some had caps of the feathers of the tropic-bird, and some had cloth turbans. Their arms were long lances, made of the hard wood of the tree called Etoa, well polished and sharpened at one end, some of which were 20 feet long, and three fingers thick. They had also a weapon, which was both a club and pike, and made of the same wood, about seven feet long, and polished and sharpened at one end with a broad point. As a guard, when they attacked each other, they had several folds of mats, placed under their clothes from the

the neck to the waist. Other things which were seen in this island were superior to any which our navigators had seen before: the cloth was better dyed, and painted with greater neatness and taste; the clubs were better cut and polished; and the canoe, though small, was very richly ornamented and well carved. Their hostile disposition prevented any intercourse. Hawkefworth's Voyages, vol. ii. p. 273. &c.

OHETUNA, a harbour on the south-east coast of Ulietea.

OHEVAHOU, an island in the South Pacific ocean. S. lat. $9^{\circ} 42'$. W. long. $139^{\circ} 2'$.

OHHUD, a mountain of Arabia, in the province of Hedjas, where Mahomet was defended by the Koreish; 8 miles N. of Medina.

OHIO, one of the United States of America, admitted into the union by act of congress, April 28th 1802, and organized March 3d 1803. Its length and breadth are 200 miles each; and it lies between $38^{\circ} 10'$ and 40° N. lat., and $80^{\circ} 30'$ and $85^{\circ} 45'$ W. long. Exclusively of the waters of lake Erie and Sandusky, it contains 39,128 square miles nearly, or 25,043,637 acres; of which 17,409,717 acres have been purchased of the Indians. Of these lands, to which the Indian title is extinguished, 580,159 acres have been appropriated for the endowment and support of an university, an academy, and schools, and for the support of religion; 8,418,068 acres are private property; and the remaining 8,411,490 acres are reserved for the future disposal of congress. This state lies west of Pennsylvania, and is bounded south by the Ohio river; west by the Indiana territory, being separated from it by a line drawn from the mouth of the Great Miami river due north, nearly to the parallel of 42° N. lat.; north by Michigan territory and lake Erie, from the former of which it is divided by an east and west line drawn through the southerly extremity of lake Michigan, and intersecting the territorial line in lake Erie; east by Pennsylvania. In 1804, this state was divided into 18 counties, as in the following table:

Counties.	When constituted.	No. white Males of 21 Years and upwards, according to the Census of 1803.	Chief Towns.
Trumbull	1799	1111	Warren
Columbiana	1803	542	
Jefferson		1533	Steubenville
Bellmont	1803	1030	Pultney
Washington	1788	1246	Marietta
Gallia	1803	307	Gallipolis
Scioto	1803	249	Alexandria
Adams		906	Massiesburgh
Clermont		755	Williamsburgh
Hamilton	1799	1700	Cincinnati
Muskingum	1803	†	
Fairfield		1051	New-Lancaster
Ross		1982	Chillicothe
Franklin		240	Franklington
Warren		854	
Greene		446	
Butler		836	
Montgomery		526	
		15,314	

† Included in Washington county.

The whole number of inhabitants in Ohio in 1803, was estimated at about 76,000, exclusively of several hundreds of people of colour, and the constant influx of emigrants amounting yearly to about 12,000.

For judicial purposes, the state of Ohio is divided into three circuits, viz. 1. Butler, Clermont, Greene, Hamilton, Montgomery, and Warren. 2. Adams, Fairfield, Franklin, Gallia, Ross, and Scioto. 3. Belmont, Columbiana, Jefferson, Trumbull, and Washington.

The chief towns of this state are Marietta, Chillicothe, Cincinnati, Gallipolis, Xenia, &c. which see respectively. The principal rivers are the Ohio, Muskingum, Heckhocking, Scioto, Miami, &c. Although a great part of this country is uneven, it cannot be called mountainous nor even hilly. However, in the upper and northern parts of the state it may deserve the latter appellation, and it is too rough to admit of much cultivation; and in other parts the inundation and settlement of the waters render it waste land. No part of the federal territory unites, as it is said, more advantages, with regard to health, fertility, variety of productions, and foreign intercourse, than that tract which stretches from the Muskingum to the Scioto and the Great Miami rivers. The country on the Ohio is every where pleasant, with large level spots of rich land, and remarkably healthy. The bottom and sides of the river are stony from Pittsburg down to the low country, a distance of about 800 miles. The strata of stone are horizontally disposed, and consists principally of either free-stone or lime-stone. Although the flat lands on the Ohio are not surpassed by any in the United States for fertility, they are in many places small and inconsiderable, being encircled by hills and mountains on one side and the river on the other. The lands on the various streams that fall into the Ohio are interspersed with all the variety of soil which conduces to pleasantness of situation, and lays the foundation for the wealth of agricultural and manufacturing people. Large level bottoms, or natural meadows, (*priaries*) from 20 to 50 miles in circuit, are every where found bordering the rivers and variegating the country in the interior parts. These afford a peculiarly rich soil, and may be cultivated with little labour. In many of these bottoms a man may clear an acre a day, fit for planting with Indian corn; as here is no underwood, and the trees, which grow high and large, are not thickly set. This country produces all the necessaries of life in great abundance, and far beyond the consumption of the inhabitants; the residue, with many other articles, such as hemp, cordage, hard-ware, glass, whiskey, apples, cider, and salted provisions, are carried down the river to New Orleans, where they find a ready market. Iron, lead, and copper are found in several places: besides native sulphur, nitre, and also vitriol and alum. Every part of the state supplies pit-coal (lithanthrax); and the mines of it are not only abundant, but inexhaustible, from Pittsburgh many miles down the river. Boles and pigments are found on the banks of the rivers: clay suitable for pottery and bricks is abundant. On the banks of the Ohio are fine marcasites, sometimes called thunder-stones; these are black, less ponderous than coal, and yet capable of giving fire when struck against steel. Their composition is irregularly foliaceous; in the fire they yield a blue sulphurous flame, and calcine into a purple powder. The natives use them in curing or rather bleaching leather. The prevailing growth of timber and the more useful trees are maple and sugar-tree, sycamore, black and white mulberry, some of which are of a very large size, black and white walnut, chefnut, various sorts of oak, hickory, cherry, buck-wood, or horse chefnut, honey-locust, elm, cucumber-tree, lynn-tree, gum-tree, iron wood, ash,

ash, aspin, sassafras, crab-apple tree, papaw or custard apple, a variety of plum trees, nine bark-spice, and leather wood bushes. Both the high and low lands produce great quantities of various kinds of grapes, from which the fettlers supply their own consumption with rich red wine. Hops grow spontaneously. The sugar maple is the most valuable tree for an inland country. One tree will yield on an average about four pounds of sugar a year, and the labour is trifling. The sap is extracted in the months of February and March, and granulated, by the simple operation of boiling, to a sugar equal in flavour and whiteness to the best Muscovado. Springs of excellent water abound in every part of the territory; and small as well as large streams for mills and other purposes are interspersed; but as there is little fall in the streams, they fail in dry seasons, and good mill-seats are scarce. The swamps may be easily drained and converted into arable and meadow land; and the hills, though frequent, are gentle and swelling; the soil is deep and rich, covered with a heavy growth of timber, no where incapable of tillage, and well adapted to the production of wheat, rye, indigo, tobacco, &c. In this state, the orchard and garden fruit-trees thrive surprisingly; the peach trees bear abundantly, and the fruit is superior in size, beauty, and flavour to any that is raised in the northern states. The productions of the fields, in general, are wheat, oats, barley, rye, Indian corn, hemp, flax, and cotton. The gardens yield all the culinary plants in perfection. Melons grow to a large size, and ripen into deliciousness. Over the surface of the ground and in the extended forests grows a natural herbage, in great abundance, on which cattle are found to thrive remarkably well. This country also affords ample gratification to the curious botanist in his researches for new, rare, and curious plants. The climate in this state is exceedingly mild and agreeable. The winter commences at the solstice and lasts about two months. The snow does not lie upon the ground for more than three days. It seldom freezes for more than five or six days successively, at which time the surface of the stagnant waters and of the smaller streams is congealed. The winds in winter are very variable; and the severest cold attends the N.W. wind. In January are many fine days, a pure serene air, and clear sun-shine, with southerly and south-westerly winds. The spring is attended with rains and cloudy weather, with south and southerly winds. In the latter end of April the season is in its flowery prime. During the summer the heats increase, tempered at night by refreshing breezes up the river. There are frequent showers with thunder. The autumn is distinguished by serene and fine weather: but at the autumnal equinox the rains begin, with cold winds from the N.E. round to the N.W. The salubrity of the climate is equal to that of any part of the United States; though on some of the low and wet grounds fever and ague are prevalent. The distance of 100 miles N. or S. makes a great difference in the temperature of the air. Near the river Sandusky the cold is much more severe, with a greater quantity of snow, than on the Muskingum; and on the Scioto snow hardly ever remains on the ground. The weather also varies considerably on the E. and W. side of the Alleghany mountains. All storms of thunder and lightning rise either with S.W. or N.W. winds; but in Pennsylvania the N.W. wind brings fine and clear weather.

The exports from this country consist of flour, corn, hemp, flax, cotton, beef, pork, smoked hams, venison, whiskey, peach-brandy, oak-staves, lumber, &c. raw and tanned hides, and peltry. Ship building has lately commenced and is likely to increase with advantage to the country.

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No country was originally better stocked with wild game of every kind than this. Innumerable herds of deer and wild cattle were sheltered in the groves, and fed in the extensive low grounds that abound here. Turkeys, geese, ducks, swans, teal, pheasants, partridges, &c. were within a few years past very plentiful; but on the approach of fettlers, buffaloes disappear. Geese and swans are now seldom killed; ducks are not plentiful. Bears, deer, and turkeys, are now the principal game. At the falls of the Ohio, geese and swans are found in great plenty. The rivers abound with various kinds of fish, which are generally large and of excellent quality.

Among the curious antiquities of this country we may mention its forts, which are mostly of an oblong form, situated on well chosen ground, and contiguous to water. They are very ancient, and it is supposed that they were constructed 1000 years ago, but for what purpose and by whom, are questions of speculation and research. At a convenient distance from these are tumuli or mounds of earth, somewhat resembling the barrows of other countries (see BARROW); and which have been found to contain a chalky substance, supposed to be bones and of the human kind. Other works have been discovered 90 miles from Marietta, on one of the western branches of the Muskingum, extending near two miles, the ramparts of which are now in some places more than 18 feet in perpendicular height. These elevated mounds, squares, and forts, resemble those of Mexico, and it has been suggested that they have the same original; and they have been ascribed to a people, the most ancient of which there is any account in that part of the world, called by Clavigero, in his "History of Mexico," Toltecas. He describes these people as celebrated for their superior civilization and skill in astronomy and the arts. These people are said to have been banished from their native country, and to have commenced an emigration about the middle of the sixth century. In the course of their emigration they itaid for different intervals of time in various stages of their journey; in some places erecting houses and directing their attention to the concerns of agriculture. The fact of such an emigration from a northern region of these brave and warlike people, at an early period, though it is not possible accurately to ascertain the dates of every event, cannot be doubted: and that they erected the fortifications and mounds that are here mentioned, as they advanced in their progress, seems not improbable. It merits consideration also, that the situation, construction, form, and general contents of the Asiatic tumuli and the ancient American mounds are so similar, that they may be ascribed to the same people. Many other reasons may be suggested to justify the opinion that the aborigines of America were descendants of the ancient Scythians, and passed into that continent from the eastern parts of Asia; such is the practice of scalping their prisoners, the fabric and structure of birch canoes, the method of marching in what is called "Indian file," and the construction of implements of war and instruments of the chase. Many other circumstances might be mentioned, in which there is a resemblance between the ancient Americans and the Tartar tribes of Asia.

Other curiosities of this country, are the caves of artificial construction found on the bank of the Ohio: in one of which, called by the Indians "the habitation of the great spirit," are found inscriptions, names of persons, dates, &c. Among the natural curiosities of this country we might also mention the "Prairies," which are immense plains of different forts, occasioned either by the exiccation of lakes or vast morasses, or by the absorption of the rains that fall upon them, and which resemble the vast "Steppes" in the upper parts

parts of Russia and Siberia. There are also found open cleared spots on the summits of hills, called "Buffaloe beats," because they are supposed to have been occasioned by the resort of these animals thither in fly time. The "salt licks" are also among the natural curiosities of this country.

For a more particular account of these remains of antiquity we refer to Harris, *ubi infra*. At Athens, in the district of Middletown, is the "Ohio University," established by an act passed on the 12th of December, 1801. This institution, though recently established, is endowed with 46,000 acres of land, within which the town of Athens, on the Hockhocking river, 40 miles by water from the Ohio, is pleasantly situated. Of this land, 1500 acres were cleared in 1804, leased, and inhabited by 100 families. The corporation consists of the governor of the state for the time being, the president, and not more than 15, nor less than 10 trustees.

The legislative authority of this state is vested in a general assembly, composed of a senate to be chosen biennially, and a house of representatives to be chosen annually, both by the people: the representatives to be proportioned by law from time to time to the population. The senators are divided into two classes, by lot; the seats of the first class to be vacated at the expiration of one year; of the second at the expiration of the second year; so that one-half is to be annually chosen. The house of representatives have the power of impeachments, which are to be tried by the senate. The supreme executive power is vested in a governor to be chosen biennially, by the people: he is eligible only six years in any term of eight years. The judiciary power is vested in a supreme court, in courts of common pleas in each county, and justices of the peace. The judges of the supreme and county courts are to be appointed by a joint ballot of the two houses of assembly, to hold their offices for seven years. In all elections, all white males, above the age of 21 years, having resided in the state one year next preceding the election, and who have paid or are charged with a state or county tax, shall enjoy the right of an elector, in the district where he actually resides at the time of the election.

The settlement of this county was checked and retarded for several years by the Indian war, which terminated on the 3d of August 1795, when a treaty was formed at Greenville between major-general Anthony Wayne on the part of the United States, and the chiefs of the following tribes of Indians, *viz.* the Wyandots, Delawares, Chawanou, Ottawas, Chippewas, Putawatimes, Miamis, Eelriver, Weeas, Kickapoos, Pian-Kashaws, and Kaskaskias. By this treaty the Indians ceded a considerable territory to the United States, and the latter relinquished their claims to lands that are particularly described. Presents were made to the Indians of goods to the amount of 20,000 dollars; and the treaty stipulated the grant of goods every year thenceforward, to the amount of 9500 dollars, at first cost in the United States, to be delivered to the Indians at some convenient place northward of the Ohio. Since this treaty, a trade has been opened by a law of congress with the forementioned tribes of Indians, on a liberal footing, which promises to give permanence to the treaty and security to the future inhabitants. Morse's Geography. Harris's Journal of a Tour, &c Boston, 1805.

OHIO, the principal river in the state above-described, separating this state and Indiana territory from Kentucky and Virginia on the S.E. and formed by the confluence of the Alleghany and Monong hela below Pittsburg. Both the names, Alleghany and Ohio, have the same meaning in different Indian languages; the former in the Delaware,

and the latter in the Seneca, signifies the "fine, or fair river;" and the whole stream, from its head to its junction with the Mississippi, was so denominated by these respective nations. Hence it was first named by the French, "La Belle Riviere." From Pittsburg it takes a N.W. course for about 25 miles, then turns gradually to the W.S.W., and pursuing that course for about 500 miles, winds to the S.W. for nearly 160 miles, and at length empties itself into the Mississippi in a S.E. direction, about 1100 miles below Pittsburg, and nearly at the same distance above New Orleans, in N. lat. $36^{\circ} 43'$, or $37^{\circ} 0' 20''$. It is very crooked in its course, but its general direction is S. 60° W. At fort Pitt, it is a quarter of a mile wide; 500 yards at the mouth of the Great Kanaway; 1200 yards at Louisville; and at the rapids, half a mile, in some few places below Louisville, but its general breadth does not exceed 600 yards. In some places its width is not 400, and in one place particularly, far below the rapids, it is less than 300. Its breadth in no place exceeds 1200 yards, and at its junction with the Mississippi, neither river is more than 900 yards wide. Its length, as measured according to its meanders by Capt. Hutchins, is as follows: From Fort Pitt

	Miles.
To Log's Town - -	18 $\frac{1}{2}$
Big Beaver Creek - -	10 $\frac{3}{4}$
Little ditto - -	13 $\frac{1}{2}$
Yellow Creek - -	11 $\frac{3}{4}$
Two Creeks - -	21 $\frac{3}{4}$
Long Reach - -	53 $\frac{3}{4}$
End Long Reach - -	16 $\frac{1}{2}$
Muskingum - -	26 $\frac{1}{2}$
Little Kanaway - -	12 $\frac{1}{4}$
Hockhocking - -	16
Great Kanaway - -	82 $\frac{1}{2}$
Guyandot - -	43 $\frac{3}{4}$
Sandy Creek - -	14 $\frac{1}{2}$
Scioto - -	48 $\frac{3}{4}$
Little Miami - -	126 $\frac{1}{4}$
Licking Creek - -	8
Great Miami - -	26 $\frac{3}{4}$
Big Bones - -	32 $\frac{1}{2}$
Kentucky - -	44 $\frac{1}{4}$
Rapids - -	77 $\frac{1}{4}$
Low Country - -	155 $\frac{1}{2}$
Buffalo River - -	64 $\frac{1}{2}$
Wabash - -	97 $\frac{1}{4}$
Big Cave - -	42 $\frac{3}{4}$
Shavane River - -	52 $\frac{1}{4}$
Cherokee river - -	13
Massack - -	11
Mississippi - -	46

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In common winter and spring floods, the Ohio affords 30 or 40 feet of water from the Mississippi to Louisville; 25 or 30 feet to La Torte's rapids; 40 above the mouth of the Great Kanaway; and a sufficiency at all times for flat-bottomed boats and canoes, to Fort Pitt. The inundations of this river begin about the latter end of March, and subside in July, although they frequently happen in other months. Besides the waters of many creeks, the Ohio receives in its course several rivers; *viz.* the Great and Little Kanaway, or Kenhawa, the Great and Little Guyandot, the Great and Little Sandy, Licking, Salt, Cumberland, and Tennessee from the E. and S.; and the Muskingum, the Hockhocking,

Hockhocking, the Great and Little Scioto, the Great and Little Miami, and the Wabash, from the N.

The *rapids* in the Ohio are situated in N. lat. $38^{\circ} 8'$, according to Hutchins's Survey; 705 miles below Pittsburg. They are occasioned by a ledge of rocks, which extends across the bed of the river. When the water is low, the greater part of the rocks becomes visible, and the navigation is difficult; though there is a channel through which flat-bottomed boats can pass in safety, conducted by a skilful pilot: but in the time of the freshets, the rapids are hardly to be perceived by the navigator, except from the superior velocity of the vessel's movement; and then a 74 gun-ship might descend with the greatest ease. The situation of the rapids is very delightful; and the town of Louisville commands a grand view of them. In levelling their descent, it has been found to be $22\frac{1}{2}$ feet in two miles, except at the rapids. The current of this river is gentle, its waters clear, and its bosom smooth and unbroken.

The numerous islands interspersed in this river add much to the beauty of its appearance; but they embarrass the navigation, particularly in low water, as they occasion shoals and sand bars. The extent of some of these islands is considerable; their soil is rich, and they are covered with a fine growth of trees. Morfe and Harris.

OHIO, the north-westernmost county of the state of Virginia, bounded E. by Washington county in Pennsylvania, and N.W. by the river Ohio, which separates it from the state of Ohio. It contains 4483 free inhabitants, and 257 slaves. Its chief town is West Liberty.—Also, a county of Kentucky, containing 1121 inhabitants, of whom 122 are slaves.

OHIOPE, a small northern tributary stream of Alatamaha river, in Oglethorpe county, Georgia, in America.

OHIOPINGO, a tract of land in the state of Kentucky, situated in Nelson county, on the river Ohio, S.W. of Salt river.

OHIOPYLE FALLS, a cataract of America, in Youghiogany river, about 20 feet in perpendicular height, and 80 yards wide, at the distance of 30 or 40 miles from the mouth of this river, where it mingles its waters with those of the Monongahela.

OHITABOO, an island in the South Pacific ocean. S. lat. $9^{\circ} 55'$. W. long. $139^{\circ} 6'$.

OHLAU, a town of Silesia, in the principality of Brieg, on the river Ohla, which rises four miles S. of Munsterberg, and runs into the Oder at Breslau. The town is situated in the midst of marshes, and surrounded with walls and ramparts. It has a large castle, a copper flattening mill, and two churches, one for Roman Catholics and another for Protestants. It has also a Polish church. Its vicinity yields great quantities of tobacco, 8 miles N.W. of Brieg.

OHLM, or ULM, a town of Germany, in the circle of the Lower Rhine, and electorate of Mentz, on the Selz; 6 miles S.W. of Mentz.

OHM, a river of Germany, in the circle of the Lower Rhine, which runs into the Lahn, near Marburg.

OHOULANG, a town of Thibet; 107 miles S. of Haratoube.

OHRA, a river of Germany, in the circle of Lower Saxony, which runs into the Unstrutt, 6 miles N. of Erfurt.

OHRDRUF, a town of Germany, in the circle of Upper Saxony, and principality of Gotha, capital of the county of Glaichen. After having often suffered by fire, it is now in a flourishing state by its numerous manufactures; 8 miles S.S.E. of Gotha.

OHRENBAU, or OHRNBAU, a town of Germany, in the

circle of Franconia, and bishopric of Aichstatt; 6 miles S.S.E. of Anspach.

OHRINGEN, or ORINGAWE, a town of Germany, in the circle of Franconia, and principality of Hohenlohe, on the Ohrn, which runs into the Cocher: this river divides it into the Old and New Town; it contains two churches and an hospital; 34 miles E.S.E. of Heidelberg.

OHRLE, a town of Germany, in the circle of Lower Saxony, and duchy of Bremen; 3 miles S.W. of Bremervord.

OHTAKARI ISLANDS, a cluster of small islands on the E. side of the gulf of Bothnia. N. lat. $64^{\circ} 6'$. E. long. $23^{\circ} 26'$.

OI, a river of Russia, which runs into the Yenisei, N. lat. $55^{\circ} 16'$. E. long. $91^{\circ} 34'$.

OIA, a river of Russia, which runs into the Obiskai gulf, N. lat. 68° . E. long. $72^{\circ} 24'$.

OJA, a town of Sweden, in the province of Sconen; 21 miles S.S.E. of Lund.—Also, a town of Sweden, in the province of Smaland; 9 miles S.W. of Wexio.

OIBO, or MAOIBO, one of the Querimba islands, in the Indian sea, near the coast of Africa. S. lat. $12^{\circ} 12'$.

OICH-LOCH, a considerable lake in the county of Inverness, Scotland, is situated in the great vale of that district, and constitutes part of the series of lakes and rivers which extend across the whole island, from the Moray Frith to the Sound of Mull. It is about four miles in length, and contains several beautiful little islands covered with trees. The banks of this lake rise very gradually, and form a series of small bays on each side. From its eastern extremity issues the river Oich, which, after a course of five miles, discharges itself into loch Ness, at the distance of 400 yards from the mouth of the river Tarff. The peninsula between these streams is distinguished as the site of Fort Augustus. This is a regular fortress, defended by four bastions, and has barracks capable of accommodating a garrison of four hundred men. It is not, however, considered a place of any strength, being commanded by the surrounding hills. The rebels stormed this fort in 1746, but not deeming it of importance to the success of their cause, soon again abandoned it, after destroying the greater part of the fortifications.

OICHIL, a mountain of Scotland; 12 miles S.W. of Perth.

OJECK, a town of Poland, in the palatinate of Sandomirz; 12 miles S.S.W. of Sandomirz.

OJEON, a town of Japan, in the island of Ximo; 25 miles S.W. of Awa.—Also, a town of Spain, in the province of Granada; 3 miles N. of Marbella.

OJEREN, a lake of Norway, in the province of Aggerhuus; 24 miles long and two wide; 10 miles E. of Christiania.

OJESTADS, a town of Norway; 24 miles N.N.E. of Christianfand.

OIGNY, a town of France, in the department of the Cote d'Or; 12 miles S. of Chatillon sur Seine.

OJIO, a town of New Navarre; 24 miles E. of Casa Grande.

OIL, in *Chemistry* and the *Arts*. Oils are divided into two classes: A. *Volatile*, and B. *Fixed oils*. The latter into two orders: a, fat, and b, drying oils.

A. *Volatile or Essential Oils*.—These are so called because they are evaporable at a moderate heat without decomposition, and because in them the odour or fragrance, or as the old chemists called it, the *essence* of vegetables consists. Oils of this kind are obtained generally from vegetables, and some varieties from animals. They are extracted from the roots,

Z z 2 leaves,

OIL.

leaves, flowers, seeds, and fruits of vegetables, but seldom from seeds with two cotyledons, which generally afford the fixed oils; while the husk, or cover of the seed, is always more or less impregnated with volatile oil, the acrimony of which defends in some degree the rudiments of the young plant from the depredations of insects. The volatile oils, which are procured from the fruits of the lemon, the orange, and the bergamotte orange, are those which alone are capable of being obtained by expression. For this purpose a small wheel, with its circumference set with stout nails, is put in motion, and a lemon or orange is applied to it till the whole of the yellow outer rind is rasped away. The raspings fall to the bottom of the case in which the wheel turns, and they are then squeezed between two plates of glass. By this gentle pressure the essential oil flows from the ruptured cells into any adjoining vessel, and is there suffered to rest till the water and other impurities have subsided. In a way similar to this is obtained in India the precious perfume called the oil or "otter" of roses. For this purpose a clean cask or glazed earthen jar is filled with rose-leaves separated from its calyces, which are covered with spring-water. The vessel is then set in the sun for two or three days, and brought under cover in the night. At the end of the third or fourth day small particles of yellow oil will float on the surface of the water, which in a week will have accumulated into a thin scum: this scum is taken up by a little cotton tied to the end of a stick, and squeezed into a small phial.

Essential oils are generally obtained by distillation. The fresh herbaceous plant, or the dried plant, previously macerated for a few hours in water, or the bark or wood rasped or cut into shavings, and macerated for several days, are closely rammed down in a tinned copper still or alembic; and when covered with water, the head of the still is luted on and the refrigerator filled with cold water, and then the fire is lighted and so regulated as to keep the contents of the still constantly simmering, without boiling. The steam condensed in the worm will form a small stream of water, which is to be collected in proper vessels, till it comes off nearly insipid and inodorous; and then the distillation is stopped. The first part of the produce, as it is turbid from super-saturation with essential oil, is kept for some hours in a cold place, during which time the excess of oil will separate from the water, and either float on the surface or sink to the bottom, according to its specific gravity. The oil is completely separated from the distilled water by an instrument

called the Italian recipient; and the whole of the water produced by the first distillation is employed in the next, instead of plain water; so that thus the produce of oil in the second distillation will exceed that of the first, by the whole quantity held in permanent solution by the water of the former process. By this process, the amount of oil yielded by equal quantities of the same substance will form a constantly increasing series, till the whole of the water drawn off by each distillation is completely saturated with oil. It is not till the seventh, or even sometimes the tenth distillation, that the produce of oil attains its maximum. Essential oil may be procured not only from odorous vegetables themselves, but from such of the immediate products of vegetation as possess any odour; such are the balsams and many of the resins and gum resins. The peculiar odour of vegetables, when not in a state of decomposition, depending on the volatile oil they contain, it is plain that the odours of the oil themselves are equally various. Their taste is exceedingly hot and pungent, and in some, particularly the oil of peppermint, followed by a remarkable sensation of coldness, though the thermometrical temperature undergoes no change. The acrimony of some of the oils, as the oil of cloves, is so great as actually to destroy the outer skin of the tongue and of other sensible parts. The colours of essential oils are various, some being blue, others green; but the usual colour is light yellow, verging more or less by long keeping to reddish-brown. Other striking characters of volatile oils are that they are liquid, more or less at different temperatures, sometimes thick and glutinous like the expressed oils, and sometimes solid and in crystals. In the latter state they approach the nature of resins. They are highly combustible, producing much smoke, condensing into foot. They are also of an agreeable strong smell, and of a pungent acrid taste. They are volatile at a heat less than 212° . And they give a greasy stain to paper, but evaporate without leaving any mark. Volatile oil, however, may be detained in a higher heat by mechanical mixture with dry clay or sand; and then it undergoes a partial decomposition, carburetted hydrogen being given out, and a little charcoal remaining in the receiver; the undecomposed residue, if subjected three or four times successively to similar treatment, will be entirely destroyed.

The following table exhibits the most prominent properties of some of the volatile oils.

TABLE of Volatile Oils.

Names.		Colour.	Specific Gravity.	Consistency at 60° . Freezes at 14° .	Odour.
Turpentine	-	None.	.792	Fluid as water.	Strong.
Juniper	-	Green.	.611	Very fluid.	Strong smell.
Rosemary	-	None.	.934	Thin liquid.	Like the plant.
Mint	-	None.	.975	Very fluid.	Agreeable.
Cloves	-	None.	1.034	Oily and very fluid.	Very fragrant.
Lemon	-	Yellow.		Thin liquid.	Very agreeable.
Orange	-	Yellow.	.888	Ditto.	Nearly similar.
Cinnamon	-	Yellow.	1.035	Oily and less liquid.	Pleasant.
Sassafras	-	None.	1.094	Oily.	Like the root.
Fennel	-		.997	Becomes solid at 50° .	
Tansy	-		.946		Very strong.
Dill	-		.994		
Caraway	-	None.	.94		Very strong and pungent.
Penny Royal	-		.978		Agreeable, like the plant.
Custamin	-		.975		

Nutmegs

OIL.

Names.	Colour.	Specific Gravity.	Consistency at 60°. Freezes at 14°.	Odour.
Nutmegs - -	None.	.948	Like butter.	Very pleasant.
Aniseed - -	None.		Becomes solid at 50°.	Very strong.
Thyme - -	Brown.		Crytallizes.	Like camphor.
Spike - -	Yellow.	.936		Very strong.
Lavender - -	None.		Thin liquid.	Very agreeable.
Origanum - -	•	.94		Very strong and acrid.
Wormwood - -	Green.			
Camomile - -	Blue.			
Hops - -	Green.		Like butter.	Like the flower.
Parley - -	Green.			
Bergamotte - -	Yellow.		Not oily. Is solid at 23°.	Very pleasant.
Cardamom - -	None.		Oily.	
Mace - -			Oily.	Agreeable.
Roses - -	None.			
Peppermint - -	Green.		Thin liquid.	Very agreeable.
Savine - -	None.			Disagreeable.
Pepper - -	None.		Like butter.	Very acrid.

When the volatile oils are recently distilled they evaporate without leaving any residuum. They are distilled with greater facility when water or alcohol is present. After they have been exposed to the air for some time they do not entirely evaporate, but a slight residuum is left of the nature of resin. When deprived of heat to a certain extent they become solid, having an unctuous appearance. Some of them assume the crystalline form.

It has been asserted by Tingry, that light has the property of increasing the absolute weight of the volatile oils when exposed in a close glass vessel, the air at the same time being excluded. This fact, however, ought to be doubted, till confirmed by stronger evidence. This he attributes to the fixation of light, a thing at present unknown to chemists. The essential oils, especially the more volatile of them, deoxygenate atmospheric air very completely, as was first ascertained by Dr. Priestley, and this circumstance partly accounts for the uneasy sensations experienced by most persons when in a close newly painted room.

The action of oxygen upon these bodies is very conspicuous. They become viscid, and assume a yellow colour. The colour becomes deeper, more especially if it is exposed to the sun, and the oil ultimately assumes the form of resin. In thick oils another change takes place; a weakly acidulous water is produced, and prismatic crystals are deposited; the residue of the oil becoming, in the mean time, concrete. These crystals, which have been occasionally mistaken for camphor, are slightly soluble in hot water, and more so in alcohol; to which they communicate the property of reddening vegetable blues; when gently heated, they swell and crystallize in needles by cooling; when heated by the blowpipe they evaporate, but do not inflame; from these properties they have been considered as an acid very analogous to the benzoic. Some essential oils afford real camphor by evaporation, as Proult has shewn. (See CAMPHOR.) If the mass so changed into resin be subjected to distillation, an oil similar to the original comes over, leaving behind a resin of greater hardness, and more infusible than the original mass. Almost all the substances denominated resin are capable of affording a portion of an essential oil by the action of heat, the resin becoming harder and less fusible. It is on these facts that the art of japanning depends. If the surface of any body be covered with common tar, and then exposed to the heat of a stove for a certain time, the oily part evaporates, leaving a hard coating, which does not soften at a heat

short of that which would decompose it, and at the same time so hard as not to be penetrable by the nail. Common pitch and resin are of different degrees of softness, according to the extent to which the distillation has been carried. The change produced in the volatile oils, by exposure to the air, has been supposed to arise from the absorption of oxygen, but in all probability this is not the fact. That oxygen disappears is undeniable, but that it is retained in the body is doubtful. We are informed by Fourcroy, that drops of water are formed when oxygen is exposed over oil of turpentine. Hence it is highly probable, that the oxygen combines with the hydrogen of the oil, forming water, which leaves a compound having less hydrogen, and in consequence more fixed and hard.

The volatile oils, from the great quantity of hydrogen they contain, take fire with great facility, and burn with a copious white flame, producing much soot. If the products of combustion be collected, they will be found to consist of water and carbonic acid, derived from the carbon and hydrogen of the oil, with the oxygen of the atmosphere.

It is by this means that we are to expect an analysis of these substances, an object which has not yet been accomplished, but which is very desirable.

The volatile oils do not undergo any change with hydrogen or carbon. They combine to a certain extent with sulphur, by which they acquire a brownish colour, and disagreeable smell. This sulphurized oil gives out on distillation sulphuretted hydrogen; it is often called "balsam of sulphur."

It is said that these compounds are decomposed by heat with a violent effervescence, which is supposed to arise from the sulphur combining with the hydrogen, forming sulphuretted hydrogen.

Camphor, which may be deemed a concrete volatile oil, combines with phosphorus by trituration. This compound may afterwards be dissolved in most of the volatile oils. The solution is luminous when exposed to the air, so as to tell the hour of the night.

Water has little action upon the volatile oils. The water, however, dissolves as much as gives it a strong taste of the oil. When the oil is first dropped upon sugar, and this put into water, a greater quantity is retained. Advantage is frequently taken of this fact in pharmacy.

They are mostly soluble in alcohol and ether, though in limited proportions.

The alkalies have much less action upon the volatile oils than upon the fixed oils. They are more susceptible of combining with these bodies, in proportion as they approach the state of resin. Common turpentine combines with potash, while oil of turpentine is but with difficulty made to unite with it. This has been called *Starkey's soap*.

We are in possession of some facts relative to the action of acids upon the oils.

The sulphuric acid dissolves them, and mutual decomposition takes place. The colour becomes dark, and charcoal is at length deposited. When water is poured upon the solution, a resinous mass becomes separated. Hence it appears, that the oxygen of the sulphuric acid produces a similar change with the oxygen of the atmosphere.

The nitric acid, when poured upon most of the essential oils, causes them to inflame with great violence, leaving behind a spongy coal of a brown colour. The acid should be very strong for this experiment.

Muriatic acid slightly dissolves these substances, but we have no facts as to their mutual change.

It may easily be conceived, that many of the metallic oxyds will produce the same changes upon the volatile oils which are produced by the acids, and the oxygen of the atmosphere. The facility with which lead, mercury, and manganese give up their oxygen, offers a ready method for an accurate analysis of these bodies.

The volatile oils are used in medicine, and are considered stimulants. They are also used as perfumes; and in the composition of varnishes and oil paints.

Fixed, Vegetable, or Unctuous Oils.—The fixed oils have the following characters:

1. They are greasy to the touch.
2. They are mostly liquid, or rather in the state of a moderately thick, but not viscid, fluid, at the common temperature of the atmosphere, but become solid at certain degrees below.
3. They do not boil at less than 600°.
4. They take fire at a certain temperature, and burn with different degrees of brilliancy.
5. They are not acid like the volatile oils, but frequently almost insipid, or possessing a mild sub-nauseous taste, and a peculiar flavour, according to the vegetables from which they are produced. Their colour, when recent, has more or less of a greenish tinge, which by keeping becomes yellow, and in some instances orange-coloured, verging on red. Their specific gravity is usually between that of alcohol and water, as they sink in the former, and float on the surface of the latter. Of these fluids, there is no circumstance in which they differ so much as in the temperature at which they congeal: some continue solid at the highest atmospheric temperature, as palm oil, and the rest of the vegetable "butters," as they are called from this circumstance; others require being cooled down to the freezing point of water; and others, again, are capable of enduring a much greater degree of cold without becoming solid.
6. They are insoluble in water and alcohol.
7. They leave a stain on paper, which cannot be removed by evaporation.

Fixed oils are so called, because they are incapable of being volatilized by heat without decomposition. When any of them, *e. g.* olive oil, is heated in a close distillatory apparatus, as soon as the fluid has arrived at its boiling point, a white vapour is disengaged, consisting of oil, carburetted hydrogen, and carbonic acid. The first of these is for the most part condensed in the receiver; while the other two, retaining in solution a portion of oil, escape in the form of permanent gas: and when every thing volatile has been

driven off, nothing remains in the retort but a little charcoal. The oil which is found in the receiver is lighter, more limpid and volatile, than that from which it was procured; and these qualities are observed to increase by each successive distillation; carbon and carburetted hydrogen being disengaged as at first. By continuing this process with the product of each distillation, the oil at length entirely disappears, being partly decomposed, and partly carried off in solution by the carburetted hydrogen gas.

They are principally procured from the cotyledons of seeds, and sometimes, though rarely, from the pulp or flesh of fruits. The substance containing the oil is beaten to a pulp, and then heated to a certain temperature. It is then subjected to the action of a strong press, to force out the oil. Much of the mucilage is carried off with the oil. This is more particularly the case when the pulp is heated. If it be pressed cold, the oil is much freer from colour, and in a state of greater purity; but the quantity obtained is less. The oil obtained in this way is said to be *cool drawn*. If the heat be too great, the oil will be more coloured. The kernels of the common nut, the walnut, and the hickory nut, yield an abundance of oil: it is also expressed from the seeds of the lint, the rape, the poppy, and the sun-flower; and in great abundance from the exterior substance of the olive. All the fixed oils, except the latter, are obtained from the cotyledons of seeds; and it is remarkable that no seed with one cotyledon affords a fixed oil. Oil may be extracted not only by pressure, which is the most common method, but by immersion in hot water. In this latter case, the oil separates from the other ingredients with which it is naturally mixed, and rises by the force of gravity to the surface of the water, from which it is skimmed off. Recently drawn oil is more or less impure, on account of its containing a variable proportion of mucilage, fecula, and perhaps other substances: of these a part is always deposited by rest, especially if the contact of the air is not wholly excluded; but another portion remains in permanent solution; and to this that partial spontaneous decomposition in oils, called "rancidity," is principally owing. They are also obtained from animals, such as whale oil and neat's-foot oils.

All animals, except those included in the class of insects, contain oil; the quantity of which, as well as its situation in the body, is subject to considerable variety. (See *CELLULAR Membrane*, *ADEPS*, and *SEBACIC Acid*. See also *Anatomy of BIRDS*, *FISH*, and *MAMMALIA*.) While the fat remains in the living body, it is always in a fluid or semi-fluid state; but its consistence changes, when it is extracted and exposed to the common temperature. The oil or fat, investing the kidneys of quadrupeds, is called suet or tallow, and is the hardest and most solid of any; the next in hardness is the fat of the bones, and that in which the muscles are imbedded is the next in degree: the fat of the hog, called "lard," is the least solid. The fat of birds is seldom so solid as hog's lard, and in many species is actually fluid. The fat or oil of fish is almost always fluid at the common temperature. There is also fat in the yolk of eggs, which may be extracted by simple pressure, after the yolk has been coagulated by heat.

Animal oil is obtained in its purest state by shredding fresh suet, and liquefying it in boiling water, and then passing it through a piece of thin gauze, in order to separate the cellular membrane. Thus purified, its colour is yellowish-white: it is moderately hard, of a mild taste, and almost destitute of odour or flavour; it is combustible, like the fixed vegetable oils, and agrees with these in the changes produced upon it by the alkalies and other chemical re-agents.

All

All the animal oils belong to the class of unctuous or fat oils, none of them being either drying in themselves, or capable of becoming so by means of litharge and other substances. Fat, exposed to dry distillation, when it acquires the temperature of about 400° , emits a white acrid and disagreeable vapour: as the heat increases, some of the oil comes over into the receiver, and that which remains in the retort acquires a blackish tinge; empyreumatic, acetous, and sebaceous acids manifest themselves, together with carburetted hydrogen and carbonic acid of a very offensive odour. Hence it is inferred that there is a real difference between animal and vegetable oils, though it has not been pointed out by chemical analysis. The coarser kinds of animal oil, extracted by putrefaction and a strong heat, possess a much more disagreeable odour than any of the vegetable oils; and, when rancid, disengage ammonia by the action of the fixed caustic alkalies, in which they also differ from the latter. The fish oils, always rancid, are for the most part thick and glutinous, which renders them in some degree unfit for burning, and some other uses to which they are applied. Many attempts have been made to meliorate them; and it appears by the experiments of Mr. Dossie, that they may be considerably improved by means of fixed alkali and chalk, by which the albumen and gluten are thrown down, and the supernatant oil, after due rest, may be poured off in a fluid state, and very sensibly amended in consistence, odour, and fitness for burning. Animal oils are substances of very great economical importance. They are used as food, and in medicine as the basis of various unguents: they are largely employed in the manufacture of soap, and also for burning either in lamps or in the form of candles. Aikin's Dict.

Whale oil is much contaminated by different animal matters, to which it owes its disagreeable odour. It has, however, been so purified as to possess less smell and taste than the best olive oil.

All the fixed oils are of less specific gravity than water; and since they do not combine, the former must float upon the surface of the latter.

The fixed oils cannot be distilled without decomposition. They boil at 600° : a vapour comes over, which condenses into an oil, which is different from the original. An inflammable gas is disengaged, and some coal deposited. This is some proof that decomposition takes place. From these facts we may fairly conclude, that the oil of lamps and candles, when in the act of burning, undergoes decomposition. The inflammable gas and the vapour constitute the volatile part which makes the flame, while some carbon is separated, which lodges in the wick.

Fixed oils are divided into two orders: (a), *fat oils*, and, (b), *drying oils*.

(a). *Fat Oils*.—These are such as, when exposed to the air for a certain time, first become viscid, and ultimately concrete, having the appearance of tallow, and in every respect similar to fat. This oil will be more or less hard, according to the time exposed: it at the same time acquires a disagreeable odour, to which we give the name of rancidity. Of these kinds we may mention olive oil, almond oil, and that extracted from rape seed, called rape oil. This change is more rapidly brought about by dilute nitric acid, or any substance which affords oxygen. It has been supposed that the combination of the oxygen with the oil gives to it the concrete form. It is, however, to be regretted that we have not as yet learned from any experiments, whether the absolute weight of the oil be increased or diminished by the agency of the oxygen. It seems most plausible to suppose, that the oxygen combines with a portion of hydrogen of the

oil, forming water, leaving the remainder more concrete and less fusible. Olive oil, by treating it with nitric acid, may be rendered equally infusible with spermaceti.

The fat oils combine with the alkalies, earths, and most metallic oxyds, forming soaps. See SOAP.

They are not miscible with water, except through the medium of sugar, starch, or gum: With the two latter they form compounds, called *emulsions*.

They do not combine with many of the combustible bodies. They unite with sulphur, forming a dark brown compound of a disagreeable smell. On cooling, some of the sulphur is deposited in crystals. Phosphorus combines with several of the fat oils. Olive oil, when rubbed with phosphorus in a mortar, dissolves a portion of it. The solution, when exposed to the air, by opening the bottle containing it, becomes very luminous. Any substance smeared with it shines for some time, but no perceptible heat is produced.

When concentrated sulphuric acid is poured upon the fixed oils, decomposition speedily ensues. The products are water, carbon deposited, giving a black colour. The sulphur is also deposited, and some acetic acid formed. When concentrated nitric acid is poured upon oils, the action is considerable; the oil takes fire, and burns, leaving a spongy coal behind. If the acid be dilute, as has been observed, it converts the fat oils into fat like tallow.

The fixed oils combine with some of the metals. A leaden vessel soon becomes corroded by oil contained in it; the oil at the same time becoming thicker. They have scarcely any action upon tin; hence the use of the latter metal in preference to the former for oil vessels. Oil has also a decided action upon iron, as we see in the axle-trees of carriages, and in all instances in which oil is used with iron to lessen friction.

b. *Drying Oils*.—These oils possess properties mostly common to both, but differing in some particulars. They, like the fat oils, become concrete by the action of oxygen; but instead of assuming an opaque fatty appearance, they retain their transparency, and acquire the flexible property of horn.

The varieties possessing this property are the oils of nut, poppy, and lint.

These oils are less fitted for combustion than the fat oils, but are of great use for paints and varnishes, and making printers' ink. When used for the latter purpose the nut oil is preferred, on account of its not turning yellow. It is first set on fire, and allowed to burn for a short time; it is then covered by a lid to extinguish it, and allowed to boil for some time. By this treatment it loses its greasy quality, becomes thick and roapy, and is more miscible with water, a property of great importance in the above application. Drying oils become more susceptible of the concreting quality by being boiled with litharge, or almost any substance containing oxygen. Doubtless in this process the oxygen of the lead combines with the hydrogen of the oil, while the lead combines with the oil, to which it gives a dark colour, and makes it thicker. Acetate of lead, and other metallic salts, produce the same change.

When oil is mixed with the black oxyd of manganese, it some time after takes fire. This arises from a more rapid combination of the oxygen of the oxyd with the hydrogen of the oil.

The composition of the fixed oils has been given by Lavoisier, but it is not to be relied upon. He makes it consist of 79 carbon, and 21 hydrogen.

Another species of oils is found in some vegetables, which have an acrid taste, and dissolve in alcohol, like the volatile

volatile oils, but are not so volatile as to admit of distillation: The vegetable containing the oil is infused in alcohol, which dissolves the oil. The alcohol is afterwards distilled from the oil.

These oils are said to be poisonous, which appears to be their most distinguishing character. An oil of this kind is obtained from the root of the helleborus hyemalis, and another is found in tobacco.

OILS, Empyreumatic.—These approach the nature of volatile oils, and are formed during the distillation of vegetable and animal substances. They have properties nearly allied to tar, and afford, by a second and careful distillation, a liquid volatile oil, not much unlike the oil of common tar, which has many properties in common with oil of turpentine. A similar substance is obtained from pit-coal by distillation, which oil belongs also to this class.

The colour of empyreumatic vegetable oil is yellowish-red, passing into blackish-red; it has a strong odour, and an acrid empyreumatic taste; it is more volatile than the fixed oils, but less so than the proper essential ones; by re-distillation with a little water it almost wholly loses its colour, and becomes more volatile than before, though still possessed of much of its empyreumatic flavour. See Aikin's Dict.

The use of oil in stopping the violent ebullition of various substances, may be very great in many occasions of life. It is well known that if a mixture of sugar, honey, or the like, be boiling on the fire, and in danger of rising over the sides of the vessel, the pouring in a little oil immediately makes it subside. In many cases, the marking a circle round the inside of a vessel, in which a liquor of this kind is to be boiled, with a piece of hard soap, shall, like a magic ring, confine the ebullition to that height, and not suffer it to stir any farther. This is wholly owing to the oil, or fat, contained in the soap; but there is, besides these, another very important use of oil, on a like occasion, which is the pouring a little of it on any metallic solution, while making; this restrains the ascent of the noxious vapours; preserves the operator from danger; and, at the same time, by keeping down the evaporating matter, gives redoubled strength to the menstruum.

Pliny has mentioned an extraordinary effect of oil, in stilling the surface of water when it is agitated with waves, and the use made of it by the divers, for this purpose. "Omne," says he, "*oleo tranquillari*," &c. lib. ii. cap. 103. and Plutarch, in *Quæst. Natur.* asks, "*Cur mare oleo conspersum perlucidum sit et tranquillum?*" Pliny's account seems to have been either discredited or disregarded by our writers on experimental philosophy, till it was confirmed by several curious experiments of Dr. Franklin, which were published in the year 1744.

The property of oil above-mentioned has, however, been well known to modern divers and dredgers for oysters, at Gibraltar, and elsewhere. The divers in the Mediterranean, in particular, descend, as in Pliny's time, with a little oil in their mouths, which they now and then let out; and which, on rising to the surface of the sea, immediately renders it smooth, so as to permit the light to pass through the water, undisturbed by various and irregular refractions.

The Bermudians, it is said, are enabled to see and strike fish, which would be concealed from their view, through the roughness of the sea, by pouring a little oil upon it. And the Lisbon fishermen effect a safe passage over the bar of the Tagus, by emptying a bottle or two of oil into the sea, when the surf is so great as to endanger its filling their boats. Our sailors have also observed, that the water is al-

ways much smoother in the wake of a ship that hath been newly tallowed than it is in one that is foul.

Dr. Franklin was led, by an accidental observation made at sea in 1757, to attend particularly to Pliny's account; and the various informations which he afterwards received relating to it, induced him to try some experiments on the subject. Standing on the windward side of a large pond, the surface of which was rendered very rough with the wind, he poured a tea-spoonful of oil on the water. This small quantity produced an instant calm over a space of several yards square, which spread amazingly, and extended itself gradually, till it reached the lee-side, making all that quarter of the pond, perhaps half an acre, as smooth as a looking-glass. On repeating this experiment, which constantly succeeded, one circumstance struck him with particular surprise; this was the sudden, wide, and forcible spreading of a drop of oil on the face of the water, which, he adds, "I do not know that any body has considered."

When a drop of oil is put on a looking-glass, or polished marble, it spreads very little: but on water it instantly expands into a circle extending several feet in diameter, becoming so thin as to produce the prismatic colours for a considerable space, and beyond them so much thinner as to be invisible, except in its effects of smoothing the waves at a much greater distance. It seems, says Dr. Franklin, as if a mutual repulsion between its particles took place as soon as it touched the water, and a repulsion so strong as to act on other bodies swimming on the surface, as straws, leaves, &c. forcing them to recede every way from the drop, as from a centre, leaving a large clear space. The quantity of this force, and the distance to which it will operate, the author says, he has not yet ascertained; but he thinks it a curious enquiry, and wishes to understand whence it arises. In endeavouring to account for the singular effects of oil, Dr. Franklin observes, that there seems to be no natural repulsion between water and air, so as to keep them from coming into contact with each other. Therefore air, in motion, which is wind, in passing over the smooth surface of water, may rub, as it were, on that surface, and raise it into wrinkles, which, if the wind continues, are the elements of future waves. The smallest wave does not immediately subside, but in subsiding raises nearly as much of the water next to it. A small power, continually operating, will produce a great action: so that the first raised waves, being continually acted upon by the wind, are, though the wind does not increase in strength, continually increased in magnitude, rising higher and extending their bases, so as to include a vast mass of water in each wave, which, in its motion, acts with great violence. But if there be a mutual repulsion between the particles of oil, and no attraction between oil and water, oil dropt on water will not be held together by adhesion to the spot on which it falls; it will not be imbibed by the water; but be at liberty to expand itself and spread on a surface, that prevents, perhaps, by repelling the oil, all immediate contact; the expansion will continue till the mutual repulsion between the particles of oil is weakened, and reduced to nothing by their distance.

Dr. Franklin imagines, that the wind blowing over water, thus covered with a film of oil, cannot easily catch upon it, so as to raise the first wrinkles, but slides over it, and leaves it as smooth as it finds it. It moves a little the oil, indeed, which being between it and the water, serves it to slide with, and prevents friction: hence the oil dropt on the windward side of the pond proceeds gradually to leeward, as may be seen by the smoothness it carries with it quite to the opposite side: for the wind, being thus prevented from raising the first wrinkles, which he calls the elements of waves, cannot produce

produce waves, which are to be made by continually acting upon and enlarging those elements, and thus the whole pond is calmed.

Upon the whole, there is great room to suppose (notwithstanding the partial failure of an experiment made at Portsmouth, by Dr. Franklin, and others), that sea-faring people may derive advantages from using oil on particular occasions, in order to moderate the violence of the waves, or to lessen the surf, which sometimes renders the landing on a lee-shore dangerous, or impracticable.

To this purpose we are informed that the captain of a Dutch East India ship, being overtaken by a storm, found himself obliged, for greater safety in wearing the ship, to pour oil into the sea, to prevent the waves breaking over her, which had an excellent effect, and succeeded in preserving her. Phil. Trans. vol. lxiv. part. 2. p. 445, &c.

OIL, in *Agriculture*, a fatty unctuous material, obtained from animal as well as vegetable substances. These matters are distinguished into different kinds, as ethereal or essential, and fat or fixed oils: the former are acrid, volatile, odoriferous, and exist in the plants in the same states in which they are found; while the latter are fixed, destitute of odour, and mild to the taste. These last, when kept a long time, corrupt and become rancid. They do not act upon earths, but readily combine with alkaline salts, with which when caustic they form vegetable soaps.

Though these matters cannot be employed by the farmers in their simple states, as being too expensive, and having rather a noxious or poisonous effect, than a beneficial one on the growth of plants, they may frequently be used in the condition of composts with advantage, as has been the case in the application of various of the grosser sorts of materials of this nature, such as those of whale blubber, the bottoms and refuse of oil casks, &c. when blended with earthy materials, so as to be laid upon the land in an even and regular manner. And in this state of combination they have been found, by the experiments of different cultivators, to form very strong and powerful manures.

The account of Mr. C. Baldwin's trials made with the bottoms or *foots* of oil, and a rich thick South-sea whale oil, in the whole sixty gallons, is thus stated.

Having a platform or bottom of twenty loads of mould, with eight loads of dung on it, he carried on three loads of light sandy mould, and one load of brick and mortar rubbish, ground fine, and having mixed these well, and made a kind of dish of it, about five feet wide and ten feet long, with a ladle he had put over it one-half of the oil. It was in August, and the warmth of the sun soon made the thick oil soak into the compost, when it was directly thrown up in a heap, broke down again, and by five or six turnings well mixed together, and left in a heap two days, when it was spread equally over the whole dunghill; twenty loads more of good mould were then carried on, eight loads of dung, and the remaining thirty gallons of oil were mixed as before, in sandy mould, and brick and mortar rubbish, and equally spread over, and the whole was covered by trimming the four sides of the dunghill, and throwing it on the top. And thus the dunghill lay more than two months, when it was cut down by mattocks, carefully broke, well mixed, and turned over. The end of March it was carried on the field, spread and ploughed in; it lay about a fortnight, and was then ploughed again, and on the 22d of April it was drilled with the Rev. Mr. Cooke's excellent drill. The field was drilled with barley, two bushels to the acre; the crop came up in a most even and beautiful manner; every seed was up within forty-eight hours of each other; all was ripe at the

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same time, and, from a couple of months after seed-time to harvest, was rated by all who saw it, and it was seen by many, as a sixty bushel crop. At harvest, three rows were cut across the field, directly thrashed and measured; one load out of thirteen was also thrashed and measured, and both stated the crop to be sixty bushels; but to waive all possibility of dispute or doubt, he is content to state the crop at seven quarters *per* acre. As to the quality of the barley, he could here cite the opinion of one of the most eminent brewers in London, who saw the crop growing, and declared he would readily give 1000*l.* to be assured that all the barley crops in the kingdom were of equal burthen and weight; five quarters of it have been lately sent to Nethrapps, in Norfolk, as seed-barley, under the denomination of 15 comb-barley; and an eminent maltster tells him it weighs 220lbs. *per* sack, or 55lbs. *per* bushel, Winchester measure. It is added, that among the many gentlemen and farmers who saw the crop on the ground, was the celebrated Mr. Bakewell; he came with three or four others, and walking down the field, observed the hedge and bank; the bank, upon being touched with a stick, run down as sand and gravel generally do, and Mr. Bakewell being asked his opinion of the value of the land, if he does not mistake, valued it at 18*d.* *per* acre, but turning to the crop, and desiring his friends to do so also, he admitted that it seemed as if growing on land of 15*s.* or 20*s.* *per* acre. He must not omit saying that the barley followed oats, upon a lay of six years old; that the land was, as is too common in such cases, much infested with the little red or wire worm, and that the oats suffered much from them; when they were ploughing for the barley the first time, he observed many turned up by the plough, when a distant ray of hope instantly darted upon his mind, that the soil in its then state, or from its strong effluvia, might prove obnoxious to them, and he is happy in saying, that the barley did not suffer from them in the least.

It is further stated, that he is trying the experiment in Hampshire, having last autumn made up a dunghill, with twenty gallons of oil, on one-third of it for a six-acre field, which is now drilled with pease.

And he concludes by observing, that it is well known that all animal substances, in a state of corruption, wonderfully promote vegetation, and are the actual food of plants. The whale-oil which he used is an animal substance, perhaps the richest part of the animal; whether he used enough, or what is the proper quantity *per* acre, experience must point out; say he used eight loads of mould, three or four loads of dung, and twelve gallons of whale-oil *per* acre. That oil applied to land, as a food for plants, in its crude state, acts as a poison he cannot deny; but his process is very different: he believes that oil, particularly animal-oil, is the pabulum of plants, that is, oil subtilized by the salts in a compost dunghill, left there a considerable time in a state of putrefaction, and until the whole is become putrescent; then he believes he has got the best and richest manure that can be carried on land. The barley evidently proved its excellence; a ridge of summer cucumbers in his garden pointed out to many its great power, the leaves being in general from ten, to ten and a half inches broad, and the vines occupied an uncommon space of ground. Five hundred cabbages and favours, planted by the side of four thousand more, and which had only one handful of the oil manure put in each hole made by the dibble at the time of planting, were evidently near as big again as the others. See *OIL-Compost*.

OIL-Cake, the cake which remains after the oil has been expressed from flax, rape, and some other sorts of seeds. Cakes of the first sort are found to be extremely beneficial in the fattening of cattle, sheep, and other animals, in different

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districts, where they are made use of upon an extensive scale.

A recent writer has stated, that the late advances in the price of this article, have probably rendered it incapable of being made use of with much profit, except in particular cases, and where manure is a principal object: with this sort of food it is the common practice to give some other sort of meat, such as hay, cut chaff, and other substances of the same nature, and some begin by giving to a beast of a hundred stones, two cakes *per* day of about six pounds each, for six or eight weeks, and then increase them to three, till the animals become fat: at first, however, as the animals seldom like it, much less may be found sufficient. In addition to the cake, from half a stone to a stone of hay is given each day, the whole consumption in cake being about 21 cwt., and in hay 26 cwt., which at the prices previous to the late advance on these articles, rendered the expence of winter-fattening an animal of the above size something more than seven guineas: lean cattle of the smaller kinds have been made perfectly fat in the course of eight or ten weeks by this substance in the trials of Mr. Moody. The cake in this application is broken down into small parts, and frequently blended with the chaff or other substances that are made use of with it. On the continent, Mr. Young says, linseed cake is sometimes exhibited in a liquid state, being diffused in hot water, and drank by the cattle, hay and other substances being given at the same time. And in the Lincolnshire report, a method is suggested of giving cake to cattle while in the pastures in a small proportion, with great success, a practice which may be applicable, where the cake-fed beasts are not fully fattened for sale in the early spring months. It is an advantage in fattening with this and other similar substances, that the animals may be completed with them at much more advanced ages than in other modes of fattening.

But wherever this expensive sort of food is employed, great care should be taken that the cakes be fresh, good, and free from mouldiness. They are the best where the expression of the oil has not been carried too far, but where this has happened they are mostly deficient in nourishment.

It has been stated by Mr. Donaldson, that in Lancashire, Yorkshire, Norfolk, and a few other districts, they sometimes use oil-cakes of the latter kind, after being reduced to powder by means of a machine contrived for the purpose, as a manure, sometimes for wheat and barley crops, but more generally for turnips. It is always sown by hand, and harrowed in with the seed. The quantity used is from three to six quarters the acre. The price is extremely different in different districts. It was then in Lancashire from six to eight shillings the quarter, in some parts of Yorkshire from sixteen to twenty. Experience has proved, that the success of this manure depends in a great measure on the following season. If rain happens to fall soon after the rape-dust is applied, the crop is generally abundant, but if no rain fall for a considerable period, the effects of this manure are little discernible either on the immediate crop, or on those which succeed it on the land in the following year.

And in an experiment stated in the eleventh volume of the Agricultural Magazine, four ridges, about twenty yards wide each, in the middle of a large field, were alternately manured with lime and rape-seed cake. The quantity of lime was, it is supposed, three chaldrons to an acre. The part oil-caked had a quarter of a ton an acre drilled by a machine, which throws the oil-cake reduced to powder, and the turnip seed, into the same drills. The soil was a strong dry red loam, with a few spots of gravel interspersed in different parts of the field. On these gravelly spots the

turnips were rather superior on the parts which were limed; but on the loam the oil-caked ridges produced, at least, double the weight of those which were limed.

Mr. Calvert, at Albury, when oil-cake was much cheaper than at present, found it the most advantageous and profitable food that he could give his cows; three cakes a day, with eight or ten pounds of hay, or four cakes and good straw, were the usual allowance; two were given to cows in calf and growing heifers: he practised this till cake advanced beyond *q*. a thousand. How far it may answer at much higher prices, hay and butter having both greatly advanced, careful experiments will alone ascertain, which he himself should have made, but, Swedish turnips being introduced and answering uncommonly well, he lost the inducement to go on with the other food. Cake gave very good butter, and at *6*l. or *7*l. a thousand was the cheapest food that could be given. Hertfordshire Agricultural Report.

Good potatoe crops have been raised by it in some parts of Lancashire.

OIL-Compost, a substance of the manure kind, prepared by incorporating different oily materials with those of other kinds. It has been highly extolled by some cultivators, while others have thought less favourably of its properties. It is probable, however, that the expence of articles of this nature must render their use very limited in most situations.

But on the supposition that oil rendered miscible with water, constitutes the chief nourishment of vegetables, and affords their principal support; Dr. Hunter of York proposed the following oil-compost.

	£. s. d.
Take North American pot-ash 12lb.	0 4 0
Break the salt into small pieces, and put it into a convenient vessel with four gallons of water. Let the mixture stand forty-eight hours, then add coarse train-oil, 14 gallons	0 14 0
	<hr/> 0 18 0

It may be noticed, that in a few days the salt will be dissolved, and the mixture, upon stirring, become nearly uniform. Then take fourteen bushels of sand, or twenty of dry mould. Upon these pour the above liquid ingredients. Turn this composition frequently over, after adding to it as much fresh horse-dung as will bring on heat and fermentation: in six months it will be fit for use. And it is apprehended, that the above quantity will be found sufficient for an acre; his trials, however, do not give him sufficient authority to determine upon this point. But for the convenience of carriage, he has directed no more earth to be used than will effectually take up the liquid ingredients. However, if the farmer chooses to mix up the compost with the mould of his field, he would advise him to use a larger portion of earth, as he will thereby be enabled to distribute it with more regularity upon the surface. He has not yet had any extensive trial of its efficacy upon pasture and meadow grounds; but he presumes, that whatever will nourish corn, will also feed the roots of grass. When used upon such lands, it should be put on during a rainy season, as all top-dressings are injured by the solar heat, and all kinds of cattle must be kept off the lands for some time, as they will bite the grass too close in quest of the salt contained in the compost, which he has found to be the case in small trials.

It is added, that the oil-compost is only intended to supply the place of rape-dust, foot, woollen rags, and other expensive

expensive hand-dressings. It is in all respects inferior to rotten dung: where that can be obtained, every kind of manure must give place to it. But at the same time that dung affords nourishment, it opens the pores of the earth. Hand-dressings, on the contrary, give food to plants, but contribute little towards loosening the soil. This is an useful and practical distinction, and may be applied through all the variety of manures made use of by the farmer. And it is presumed, that the oil-compost resembles the natural food of plants; but he submits that, as well as every thing else, to experience our unerring guide. It may be objected, that it has not sufficiently undergone the putrid ferment, to attenuate the oily particles. The use of rape-dust, foot, horn shavings, and woollen rags, takes off that objection, and at the same time confirms the theory upon which the above compost is founded. But he does not take upon him to direct the experienced farmer in the manner of using this new compost. He would have every person apply it in the way most agreeable to himself. Many things will occur to the practical husbandman, that no reasoning of the philosopher could foresee. By attending to the different ways of using it, we may, it is supposed, reap considerable advantages. Improvements may be collected even from the highest degree of mismanagement. And facts must ever be the foundation of our reasoning. Without them, the philosopher is a kind of *ignis fatuus*. Instead of unfolding nature, he covers her with a cloud, and endeavours, as it were, to bring old chaos back again into the world. If, however, he should presume to instruct the farmer in the management of the compost, he would recommend it to be sown immediately after the grain, and both harrowed in together.

The following experiment is stated, which, though trifling in its own nature, gave him the first encouragement to prosecute the subject upon a larger scale. He took four pots, Nos. 1, 2, 3, 4.

"No. 1. contained 12lb. of barren sand, with 1 oz. of the sand oil-compost.

"No. 2. contained 12lb. of sand without any mixture.

"No. 3. contained 12lb. of sand, with $\frac{1}{2}$ oz. of flaked lime.

"No. 4. contained 12lb. of sand, with 4 oz. of the sand oil-compost."

And in the month of March he put six grains of wheat into each pot, and during the summer occasionally watered the plants with filtered water. All the time that the plants were consuming the farina, he could observe but little difference in their appearance. But after one month's growth, he remarked that No. 1. was the best; No. 2. the next; No. 3. the next; No. 4. much the worst. And in August he made the following observations: No. 1. had five small ears, which contained a few poor grains. No. 2. had three small ears, containing a few grains, much inferior in goodness to the former. No. 3. had no ears. Only he observed two very small ones within their respective sheaths, which for want of vegetable strength never made their appearance. No. 4. had no ears; the stalks appeared stunted in their growth.

"He then removed the plants from their pots, and took a view of the roots of each.

"No. 1. The roots tolerably large, and well spread.

"No. 2. The roots not so large.

"No. 3. The roots very short and small.

"No. 4. The roots much the shortest, with the appearance of being rickety."

Upon this experiment it is suggested,

"1. That the oil-compost may be considered as a vegetable food; but that, when used too liberally, the alkaline

salt will burn up the roots of the plant, and hinder vegetation. For which reason he would recommend the compost to be exposed to the influence of the air for some months, before it is laid on. 2. That lime contains no vegetable food, and is, in its own nature, an enemy to vegetation. It is, however, of excellent use in assisting vegetation."

These experiments teach him, that all kinds of soils may be benefited by this manure. The limestone, gravelly, sandy, and chalky soils seem to require it most. The rich loams and good clays have nourishment within themselves, and stand more in need of the plough than the dung-hill. And it is noticed, that it is observed by farmers, that rape-dust seldom succeeds with spring-corn, unless plentiful rains fall within a few weeks after sowing. He has more than once made the same observation upon the oil-compost, which induces him to recommend it for winter crops only. From the unctuousness of its nature, it is more than probable, that it should lie exposed for a long time to the influence of the weather, which benefit it is deprived of when used for barley, and such crops as are sown late in the spring. He is confirmed in this idea, from repeated experiments made with the compost upon turnips, which generally proved unsuccessful. And at the same time he invariably found that those parts of the field on which the compost had been spread produced the best crops of grain the following year. From this slow manner of giving its virtues, it seems to be an improper dressing for all plants that have a quick vegetation.

On the whole it is concluded, that the oil-compost, as it plentifully restores particles of the oily kind, similar to those that are carried off, has a fair appearance of proving an excellent restorative.

The following experiments in support of the utility of this sort of manure are stated. In the month of June he selected four lands of equal goodness in a field intended for turnips. The soil was a light sand, with a small portion of vegetable earth amongst it. It was ploughed out of sward in November, and had not borne a crop for many years. He distinguished his experimental lands by Nos. 1, 2, 3, 4.

No. 1. was manured with rotten dung.

No. 2. with oil-compost.

No. 3. with lime.

No. 4. was left without any dressing.

On the 20th of June they were all sown with turnip-seed, broadcast, and during the course of the season were twice hoed.

"In November he viewed the field, and made the following remarks:

N^o 1—the best.

2—the next.

3—the worst.

4—better than N^o 3.

"Here he supposes the oil-compost appears in a favourable light; but other trials, made with equal accuracy, seem rather to prove that it is not proper for turnips, barley, or quick growing vegetables. It requires being meliorated by the action of the atmosphere, and therefore is better adapted to winter crops." But by repeated experiments made since he first brought forward this manure, he is "convinced that the addition of an alkaline salt is not sufficient to alter the nature of soil, so as to make it fully capable of entering in to the roots of plants in its native form: but when decomposed by the mixture of fresh dung, he is convinced that it then becomes the true pabulum of plants."

It is supposed that "when the land happens to be stiffer than is required for turnips, it may be good husbandry to lay upon it a large quantity of lime to open its body for the free admission of the tap-root of the turnip. The lands will

also be rendered more dry, without which the turnips will never arrive at any size. Farmers, in general, take great pains to pulverize their light soils intended for turnips; but they seldom plough deep enough. A turnip is found to root deep, and in all operations of husbandry we should be careful to follow the bias of nature. It is for that reason we ought to make ourselves acquainted with the size and the shape of the roots of such plants as are the objects of field husbandry: when once we have obtained that necessary knowledge, it will be an easy matter to suit the preparation of the soil to the nature of the grain. It will also enable us to direct the variations of our crops upon just and rational principles."

But in Mr. Stovin's trials with oil-compost in 1769, the results were these:

	£	s.	d.	Produce.		
				Q.	B.	P.
"One acre, sown with barley, and manured with oil-compost - }	0	18	0	5	5	0
"One acre adjoining, sown with barley, and manured with rotten dung, twelve loads, worth - }	3	0	0	4	3	2
Difference				1	1	2

And the compost barley was bolder and better corn than the other. In the year 1770, the dunged acre produced of rye, three quarters. The compost acre, of ditto, two quarters six bushels. And in the year 1771, the same lands were sown with oats, and the produce was greatly in favour of the dunged acre. This last experiment, being contrary to the idea of good husbandry, was made with a view to determine the absolute strength of the compost. All top-dressings are exhausted in the year. The oil-compost seems to retain its vigour longer. It will here be proper to observe, that these experimental lands were in a common field, which had been many years under the plough.

Also in Mr. Townley's experiments, they were as below. "In the spring of 1770, he prepared a piece of ground for onions. It was laid out into six beds of equal size, and all sown at the same time.

"Over two of them, the oil-compost was scattered in a very moderate quantity; over the other two, pigeon-dung; and over the remaining two, some of his weed-compost, which he esteems one of the best manures, for most vegetables, that can be made." It is composed of vegetable substances reduced into a putrid state. "The onions came up very well in all the beds: but, in about six weeks, those that were fed with the oil-compost plainly distinguished the advantage they had over the rest, by their luxuriance and colour; and at the end of the summer perfected the finest crop that he had ever seen, being greatly superior to the others both in quantity and size."

In another experiment with it in this crop, his success was still much greater though the soil was worn out. The oil-compost was used as a top-dressing after the crop was sown. "The same spring he made an experiment upon four rows of cabbages, set at the distance of four feet every way. Two were manured with the oil-compost, and two with his own. All the plants were unluckily damaged, just before they began to form, by some turkeys getting into the field, and plucking off the greatest part of the leaves. However, they so far recovered as to weigh, in the September following, from 22lbs. to 28lbs. a-piece. The rows proved so equal in goodness that he could not determine which had the advantage."

And "the same year one part of a field of wheat ex-

posed to the north-east winds, which that spring continued to blow for a month or five weeks, appeared very poor and languid at the time of tillering. Over it he ordered some of the oil-compost to be sown with the hand, which not only recovered, but also pushed forwards the wheat plants in that part of the field, so as to make them little inferior, if any, to the rest."

The same spring he "made a comparative experiment upon four contiguous lands of oats, between the oil-compost and his own weed-compost. The latter had manifestly the advantage, though the other produced a very fine and large crop. He also tried the oil-compost upon carrots, and it answered exceedingly well. He did the same this year (1771), both upon them and his onions; and has the finest crops of those vegetables he ever saw any where upon the same compass of ground."

Mr. Roebuck, in trying this manure in gardening, planted twelve alleys, that lay between his asparagus beds, with cauliflower plants; each alley took up about thirty plants. One of the alleys he set apart for an experiment with the oil-compost, prepared as above.

"About a handful of the compost was put to the root of each cauliflower plant. In all other respects the alley was managed like the rest. The plants in general flowered very well; but those to which he applied the compost, sprung up hastily with small stalks, and produced very poor flowers. He imputed this unfavourable appearance to the freshness of the compost, which was only a few weeks old. In all future trials, he intends to expose it to the action of the air, in order to abate the heat, and neutralise the acrimony of the salt."

But "in the September following this unsuccessful experiment, he planted the same alleys with early cabbages. The necessity of meliorating the compost was in this trial fully confirmed. For the cabbages that grew upon the alley, which in May had received the compost, were larger, and in all respects finer, than the others. The idea that he entertains of the compost is, that when meliorated in the earth, it is capable of giving a richness and freshness to it. Upon this principle he would recommend it to gardeners as a subject worthy of further trials.

Although these experiments sufficiently shew, that substances of this sort may be used with advantage in the way of manures, their expence must in most cases prevent their being made use of to any great extent.

OIL-Manure, such as is constituted of oil with other materials. The composition of a manure of this kind, which has been said to be highly beneficial, with the expence for one acre of land in 1792, is thus stated:

	£	s.	d.
Rape or train-oil six gallons, at 2s. 6d.	-	0	15 0
Sea-sand six bushels, at 2d.	-	0	1 0
Coarse salt two bushels, at 1s.	-	0	2 0
Malt coombs 24 bushels, at 4½d.	-	0	9 0
		1	7 0

In the preparation of which, it is advised to spread the coombs on the floor about four inches thick, then to sprinkle the salt as level as possible, throwing on half the quantity of sand and half the quantity of oil out of a watering-pot, turning it and raking it well, afterwards to add the rest of the oil and sand as before, turning it well till thoroughly mixed, and then throw the whole into a heap for use. On this it is suggested, that as the prolific quality of oil-cake is only in proportion to the oil it contains, this composition must be preferable, having a much greater quantity of oil in

OIL.

in it; and as malt coombs are a manure of themselves, especially for turnip land, at about eighty or ninety bushels *per* acre, he dares venture to assert, that twenty-four bushels with the addition of oil is equal to the above quantity, or even to the twelve loads of muck. The sand and salt mixed with it, not only occasion it to imbibe the oil more freely, but likewise give it a better body for the convenience of spreading on the land. And though some may think the quantity of salt is too little, he is convinced of the contrary, having found by experience that a ton or even a ton and a half has not answered so well as three or four hundred. The case is very similar with regard to lands near the salt marshes, where the tide sometimes overflows them, and it is well known by those who occupy such lands that nothing will grow for three or four years, but afterwards they become very fertile. The reason he shall not take upon himself to give, but he has found it so by his own experience. The writer concludes by observing, that some farmers have used only half the above quantity *per* acre, notwithstanding which they had good crops. But it has been observed that the extra expence makes against its becoming generally useful from the great price of oil, and the expence of the carriage of sea sand and dross salt, in most inland situations. See *OIL-Compast*.

OIL-Paint, in *Rural Economy*, that sort of paint which is composed of oil, and the oxyd of lead, or some other similar substance, to form its basis, or give it a body, and which is used for various farm purposes.

But the great expence of paints of this sort has led lately to the introduction of many other materials, for the protection of wood work, and boarding of different kinds, such as preparations from fossil coal, &c. But a great objection to all these substances, besides their expence, is the highly disagreeable smell that they afford, and their liability to crack and blister.

In cases where oil painting cannot be had recourse to, either because it does not dry soon enough, and has an insupportable smell, or because it is too dear; the following method has been employed by Mr. Ludicke for painting ceilings, gates, doors, and even furniture, with great success: it is thus prepared, take fresh curds, and bruise the lumps on a grinding-stone, or in an earthen pan, or mortar, with a spatula. After this put them in a pot with an equal quantity of lime, well quenched, and become thick enough to be kneaded; stir this mixture well without adding water, and a white coloured fluid will soon be obtained, which may be applied with as much facility as varnish, and which dries very speedily. It must, however, be employed the same day, as it will become too thick the next day. And with this ochre, armenian bole, and all colours which hold with lime, may be mixed according to the colour which is wished to be given to the wood; but care must be taken that the addition of colour made to the first mixture of curds and lime contain very little water, otherwise the painting will be less durable.

In performing the work, after two coats of this paint have been applied, it may be polished with a piece of woollen cloth, or other proper substance, and will become as bright as varnish.

It is asserted that this paint, besides being cheap, has other advantages; in the same day two coats may be laid on and polished, as it dries speedily, and has no smell. If it be required to give it more durability in places exposed to moisture, it may be done after it has been polished with the white of an egg; which is said to render it as durable as the best oil painting that can be employed. And another substitute that may be used for painting weather boarding is

prepared by taking three parts air-slaked lime, two of wood-ashes, and one of fine sand or sea-coal ashes, lifting them through a fine sieve, and then adding as much linseed oil as will bring it to a consistence for working with a painting brush: great care must be taken to mix it perfectly. It is impenetrable to water, and the sun hardens it, and renders it a great preserver of the wood.

Another composition has likewise been made use of with great benefit to paint boards, &c. which is made in this way. Melt twelve ounces of rosin in an iron pot, adding three gallons of train oil, and three or four rolls of brimstone; when melted thin, as much Spanish brown ochre first ground fine with as much of the oil as will give the colour, should be added; it should be laid on with a brush as hot and as thin as possible, and some days after the first coat is dry another applied. It will preserve planks for a very great length of time, as well as other substances.

The kinds of oils, their properties, manners of expression, &c. are numerous: for the generality of them, the reader is referred to the proper articles.

Such as could not be more conveniently inserted, are as follow.

OIL of the Almond, in the *Materia Medica*, is obtained either from the sweet or the bitter almond, that from the one or the other being equally free from bitterness. The almonds are put into a coarse hempen or hair sack, and shaken violently, in order to detach, by friction with one another and against the sides of the sack, the outer-brown skin, which is apt to give a bitter taste to the oil: they are then bruised and made into a paste, and pressed in the usual manner. The London college directs the almonds to be macerated in cold water for 12 hours, and then bruised; and the oil is afterwards to be expressed without heat. The Edinburgh college orders any quantity of almonds to be bruised in a stone-mortar, and then put into a hempen sack; the oil is to be expressed without heat. The Dublin college prepares this oil by bruising the fresh almonds in a mortar, and expressing it by a press, without heat. Sixteen ounces of almonds yield about five ounces of a bland inodorous oil, of a very slightly sweetish taste, which is at first turbid, but soon becomes clear. About 3iii more may be obtained by impregnating the marc with the steam of boiling water. The colour of this oil is very pale greenish-yellow, and its specific gravity .932, Fabroni; .917, Aikin. The degree at which it congeals is variously stated at 10° Fahr. and 8° Fahr. It is said that the oil from the bitter almond keeps longer without growing rancid than that from the sweet almond. This oil is demulcent and emollient, and used in coughs and other pulmonary complaints united with water by means of mucilage, or the yolk of egg and fugar. A mixture of f.3iv of almond oil, m viii of acetate of lead, forms an useful injection at the commencement of gonorrhœa. The dose of the oil is from f.3iv to f.3j. See *ALMOND*.

OIL of Amber of the London college is obtained by putting the amber into an alembic, and distilling from a sand-bath, with a fire gradually raised, an acid liquor, the oil, and a salt impregnated with the oil; then re-distilling the oil twice.

The *purified* oil of amber of the Edinb. dispensatory is had by distilling oil of amber, mixed with six times its weight of water, from a glass retort, until two-thirds of the water have passed into the receiver; then separating this purified volatile oil from the water, and keeping it in well stopped vessels.

The *redified* oil of amber of the Dublin pharmacopeia is prepared by taking a pound of the oil which comes over in the preparation of succinic acid, and six pints of water, and distilling

distilling until two-thirds of the water have passed into the receiver, and separating the oil. This oil is of a dark colour, thick consistence, and foetid odour; but by successive distillations, it is rendered thinner, of a lighter colour, and at length nearly limpid. Rectified oil of amber has a strong ungrateful odour, and a hot acrid taste. It is light, volatile, and inflammable, insoluble in water, and only partially soluble in alcohol. As to its medical properties, it is stimulant, antispasmodic, and rubefacient. It has been found serviceable in deficient menstruation, and in hysteria, epilepsy, and some other convulsive affections; but it is now scarcely ever used as an internal remedy. The dose may be from \mathfrak{m} v to \mathfrak{m} xij, combined by means of mucilage with any distilled water. It is more generally employed as a rubefacient in rheumatism and paralysis; and a mixture of f. 3j of this oil with f. 3fs of tincture of opium, has been found beneficial as a friction to the affected part in tic douloureux; and in whooping-cough, rubbed upon the chest two or three times a day. The officinal preparation is the SPIRITUS *Ammoniae Succinatus* of the London college. See AMBER and SUCCINIC Acid.

OILS, *Animal*, in general, are those that are obtained from animal substances, either in the state of butter and fat, uncombined with the other principles of animal matters; of which kind are fat, marrow, the expressed oils of yolks of eggs, spermaceti, &c. Or, in a state of combination, afforded by distillation of the gelatinous substance, which forms almost entirely all the parts composing animal bodies, as flesh, tendons, nerves, cartilages, bones, horns, hair, &c. See OIL, *supra*.

OIL, *Animal*, *Oleum Animale*, in a more restricted sense, the name of an essential oil distilled by a retort from blood, and formerly recommended as a powerful internal remedy in epilepsies, the gout, and other obstinate diseases.

It was originally used in Germany in these intentions. As an external, it may probably be of good service in removing fixed pains, hard tumours, &c. for it is extremely penetrating.

OIL, *Volatile*, *Animal*, or *Dippel's oil*. (See DIPPEL'S OIL.) If albumen or gluten be distilled at a dry heat, there arises, together with the ammonia and carburetted hydrogen, a quantity of foetid black oil, which was the subject of various experiments, first by Dippel, a chemist of Berlin, and afterwards by Rouelle. From the concurrent labours of the enquirers, it appears that if this oil is rectified by three successive distillations from the surface of water, it becomes at length quite colourless and transparent; its odour is powerful, but somewhat aromatic, and it is nearly as light and volatile as ether. It contains a little ammonia, and hence changes the colour of syrup of violets green; it is sparingly soluble in water, and largely so in oils, ether, and alcohols. It combines both with acids and alkalis into imperfect soaps; it is very inflammable, and, like the vegetable essential oils, may be set on fire by strong nitrous acid. If exposed even to the light, it is partly decomposed, losing its transparency, and becoming of a brown colour. It was formerly employed in medicine; but is now wholly disused. Aikin's Dict.

OIL of *Anise-seed*. (See ANISE-SEED.) This oil is given as a carminative, and for relieving flatulence in children, from \mathfrak{m} v to \mathfrak{m} xv triturated with sugar. The officinal preparations are tinctura opii ammoniata of the Edinburgh college, and tinctura opii camphorata of the Dublin college. See TINCTURE.

OIL of *Antimony*, a name given to the butter of antimony, and some other solutions of antimony by acids. See ANTIMONY.

OIL of *Arsenic*. See ARSENIC.

OIL of *Aspic*, or *Spike*. See SPIKE.

OIL of *Balm*. See BALSAM and MELISSA.

OIL of *Bays* is an essential oil, obtained from the berries of the bay, or *LAURUS Nobilis*. These berries give out to the press an almost insipid fluid oil; and on being boiled in water, a thicker butyraceous one, of a yellowish-green colour, impregnated with the flavour of the berry. The berries and leaves of the bay are accounted stomachic, carminative, and uterine: with this view, infusions of the leaves are drank as tea, and the essential oil of the berries is given on sugar, or dissolved by means of mucilages, or in spirit of wine, from one to five or six drops. But the principal use of these simples in the present practice is external: they are made ingredients in carminative glysters, warm cataplasms, and uterine baths; and the butyraceous oil of the berries serves as a basis for some nervine liniments, and mercurial and sulphureous unguents. Lewis. See DAPHNELEON.

OIL of *Beech*, See BEECH-oil.

OIL of *Ben*, or *Ben*. See BEN.

OIL, *Birch*, a vegetable empyreumatic oil, prepared in Russia, by charring birch-wood in a close oven, the watery acid and oil being collected in a large receiver; and the latter product being the lightest, is skimmed off from the surface of the water. This oil has a peculiar scent, and is said to drive away worms and other insects; on which account it is used in the dressing of Russia leather, to which it communicates those properties that render it so much esteemed by the binders of books.

OIL, *British*, an empirical medicine of the same nature with the petrolea; the genuine sort being extracted by distillation from a hard bitumen, or a kind of stone-coal, found in Shropshire, and other parts of England. Lewis.

OIL, or *Butter*, of *Cacao*. See COCOS.

OIL, *Cajeput*. See CAJEPUT and MELALEUCA.

OIL of *Camphor*. See CAMPHOR and LAURUS.

OIL of *Caraway*. (See CARUA.) Six pounds of caraway-seeds yield $4\frac{1}{2}$ ounces of oil, which has an aromatic odour, and a sweetish pungent taste; it is viscid, and of a yellow colour; its specific gravity is .946. This oil, which is stimulant and carminative, is chiefly used as an adjunct to purgative pills, and for covering the disagreeable flavour of other substances. The dose is from \mathfrak{m} j to \mathfrak{m} x. The officinal preparations are electuarium fennæ, confectio scammonii, pilulæ aloes comp., and pilulæ aloes, cum myrrha.

OIL of *Castor*. See CASTOR and RICINUS.

OIL, *Cardamom*. See CARDAMOM.

OIL, *Causlic*. See ARSENIC.

OIL of *Chamomile*, an oil distilled from anthemis or chamomile. Its odour is unpleasant, and its taste pungent. When recently distilled, its colour is a cerulean blue, which changes by age to a deep yellow. Eighty-two pounds of chamomile-flowers yield 18 drams of oil. This oil is supposed to possess antispasmodic powers, and is therefore sometimes recommended in cramp of the stomach, and as an adjunct to purgative pills. The dose is from \mathfrak{m} v to \mathfrak{m} x, but it is seldom used. See ANTHEMIS.

OIL of *Cinnamon*. See CINNAMON.

OIL of *Cloves*. See CARYOPHYLLUS.

OIL of *Cole-Seed*. See COLE-Seed.

This oil, and also those of mustard-seed, rape-seed, and sunflower-seed, are less coloured and less highly flavoured than those of linseed and hemp-seed. They are very little liable to dry by exposure to the air; and these circumstances, together with their moderate price, induce a large consumption of them by the wool-dressers, in order to preserve

serve the wool from the attacks of moths and other insects; and also by the leather-dressers.

OIL, Connecting, a term used by Boerhaave, and his followers, to express a certain oil, found in all vegetable substances, but wholly different from, and independent of, their essential oil. This is not possessed of any of their virtues or qualities, but seems the same in all plants, and is the means of their consistence and solidity, giving tenacity to their earth, which, without it, falls to dust, and the plant exists no more.

This oil is not separable by boiling water, as the essential oil is, but only by fire: when a plant has been boiled and distilled, its essential oil, salt, &c. are all carried off, and what remains is only the earth corrected by this oil. This being exposed to the fire, the oil discovers itself in a thick, black, stinking smoke, and, finally, taking fire, it burns away, and leaves only the earth, which was the basis of the plant; retaining its form, indeed, if the process has been carefully made, but falling into a shapeless powder only on being roughly breathed upon.

This great author, therefore, establishes it as a rule, that there are three sorts of oil in plants. 1. An oily froth. 2. The essential oil, dissolved in decoction. And, 3. This connecting, or consolidating oil, separable only by a naked fire.

OIL, Cornel, a fixed oil resembling olive oil, by being contained, not in the seed, but in the pulpy fruit of the vegetable. The berries of this shrub (*Cornus Sanguinea*) being collected when quite ripe, and laid in heaps for a few days to mellow, are to be reduced to a pulp, and pressed without heat in the usual manner. By this treatment, from 22lbs. avoirdupois may be obtained somewhat more than four wine pints of a fat, somewhat viscid, oil, of a bright green colour, and equally destitute of any unpleasant flavour as the best olive oil. When heated with nitric acid, it is converted to a brown-yellow butter or wax. By boiling with litharge, it becomes drying; when spread thin on water, and exposed to the air for a month, it is converted into a white wax. It does not freeze so readily as olive oil, and lasts rather longer than this when used in a lamp. Aikin's Dict.

OIL of Cumin. See CUMINUM.

OIL of Dill. See ANETHUM.

OILS, Drying. See OIL, *supra*.

Drying oils are formed of linseed oil, prepared by means of boiling, sometimes with and sometimes without the addition of other substances. Those commonly added to oil, in this preparation, are white vitriol, sugar of lead, feed-lac, gum mastic, gum sandarac, gum anise, gum copal, umbre, colcothar, litharge, and red-lead. A drying oil for the nicer works may be prepared by boiling two ounces of gum sandarac, white vitriol, and sugar of lead, of each one ounce, in a pint of nut or poppy oil, till the solid ingredients be dissolved, and the mixture becomes of the colour of linseed oil. For coarser work, take one gallon of linseed oil, one pound of litharge of gold or silver, half a pound of white vitriol, and sugar of lead, gum arabic, and umbre, of each a quarter of a pound; boil them as long as the discolouring of the oil, which is the gradual consequence of boiling, will allow. That made for sale is prepared by boiling one gallon of linseed oil, and one pound and a half of red-lead, as long as the colour will bear it. When the calxes of lead are united in small quantity with oil, they diminish its fluidity, and dispose it to dry more readily. These oils are much used in painting, on account of their drying quality. When a large quantity of calxes of lead is combined with oil, they form with it a solid, opaque, and

tenacious body, capable of softening by heat. These combinations are useful in pharmacy, for giving a convenient consistence and tenacity to many plasters.

OILS, Distilled, are the volatile oils, so called in the London pharmacopeia. For preparing them, they direct that the seeds of anise and caraway, the flowers of chamomile and lavender, the berries of juniper and all-spice, the tops of rosemary, and the entire plants of the other articles, dried, are to be employed. Any one of these is put into an alembic, and as much water poured in as will cover it; and then the oil is distilled into a large refrigeratory. The water which distils over with the oils of pepper-mint, spear-mint, all-spice, and penny-royal, is to be preserved for use.

OIL of the Earth, Oleum Terra, in the *Materia Medica*, the name of a thick mineral fluid of a dusky brownish-black, with a faint cast of purple, and of the consistence of a thin syrup, very little transparent, and of a strong penetrating smell, like that of common oil of amber. It oozes out of the cracks of rocks, in several parts of the island of Sumatra, and some other parts of the East Indies, and is much esteemed there in paralytic disorders; but it is seldom imported into England; what our East India surgeons and captains usually bring over under this name being only a vegetable oil, impregnated with the virtues of certain of their fossils by boiling. See PETROL.

OIL, Empyreumatic. See OIL, *supra*, and EMPYREUMA.

OILS, Essential, are those which have evidently the smell of the vegetable from which they are obtained. All these oils are sufficiently volatile to rise with the heat of boiling water; and this degree of volatility is one of their specific characters. See OIL, *supra*.

The oils of plants have not always the same tastes with the plant they are distilled from, or, at least, not in the same degree. Nothing is more bitter than wormwood, yet the oil of wormwood has no remarkable bitterness. Anise, which is of a sweet taste, yields, on the contrary, an oil infinitely more sweet than the seed; and pepper, which is so remarkably hot and acrid, affords an oil no way remarkable for its pungency. Thyme, which is in itself very acrid and pungent, conveys that property, in a yet greater degree, to its oil; there is, indeed, no essential oil so acrid and fiery as that of this plant. The fetid oils drawn in dry distillation by the retort, in an open fire, no way differ from these but by the damage the fire has done them, and may always be converted into these by repeated distillations. Nay, the very fat oils, such as that of almonds, may be attenuated so far as to become as fine, and as subtle, as the essential oils. This is to be done by means of quick-lime; and several repeated distillations of this oil, or any other of a like kind, with fresh lime to every distillation, will reduce it to be volatile, penetrating, and capable of being raised, and distilled, by means of water, which is the greatest test of the essential oils. The bituminous and fetid oils may also, in the same manner, be reduced, by repeated distillations, to the state of the essential ones, and to be equally fluid and limpid, and equally penetrating. *Memoirs Acad. Par. 1721.*

The essential oils of vegetables may be divided into two classes, according to their different specific gravities, some floating upon water, and others readily sinking to the bottom thereof. Thus the essential oils of cloves, cinnamon, and saffras, readily sink; but the oils of lavender, marjoram, mint, &c. swim upon the water. The lightest of all the essential oils is, perhaps, that of citron peels, which even floats on spirit of wine; and the heaviest of them seems to be the oil of saffras.

For the obtaining the full quantity of the more ponderous oils

oils from cinnamon, cloves, saffra, &c. it is proper
 1. To reduce the subjects to fine powder. 2. To digest this powder for some days in a warm place, with thrice its quantity of soft river water, made very saline with the addition of sea-salt, or sharp with oil of vitriol. 3. To use the decoction left in the still, instead of common water, for a fresh digestion. 4. To use also, for the same purpose, the water of the second running, after it has been cleared of its oil. 5. Not to distil from too large a quantity of the subject at once. 6. To leave a considerable part of the still empty. 7. To use a brisk fire, or a strong boiling heat at first, but to slacken it a little afterwards. 8. To have a low still head, with a proper internal lodge, and current, leading to the nose of the worm. And, 9. To cohobate the water, or pour it back upon the matter in the still, after separating its oil, and repeating this once or twice more.

The vegetable world affords vast variety of essential oils, most of them very odorous, and of great virtues; but different vegetables yield oils of different consistence, and in different quantities.

These oils are employed in painting, in spirituous liquors used at the table and at the toilette, in perfumes, and in medicine. As they act very powerfully, small doses, as from one drop to four or five, incorporated with sugar, must be given internally. They are recommended as cephalic and antispasmodic, in convulsive and hysterical affections: they are also stimulant, sudorific, and strengthening. All drugs which are alexipharmic, cephalic, tonic, and stomachic, containing vegetable aromatic, derive their virtues from the essential oils of these vegetables. The same may be said of all medicinal, aromatic, and spirituous waters. In some cases, essential oils are employed externally as strengtheners, and to allay painful spasms of nervous and tendinous parts, to resolve and dissipate acrid humours, which occasion pain, without any sensible inflammation; but they must not, on account of their caustic quality, be used alone, but formed into liniments or pomatums, by mixing them with a sufficient quantity of fat, or fat oils. When applied to the human body, they stimulate, corrode, and resist putrefaction; and mixed with the blood, raise some degree of fever. Med. Ess. Edinb. vol. v. art. 24. See *Volatile OILS*, *infra*.

As many of the essential oils are dear, it is a very common practice to adulterate, or debase them several ways, so as to render them cheaper both to the seller and the buyer. These several ways seem reducible to three general kinds, each of which has its proper method of detection. These three ways are, 1. To adulterate them with expressed oils. 2. With alcohol. And, 3. With cheaper essential oils.

If any essential oil be adulterated with expressed oil, it is easy to discover the fraud by adding a little spirit of wine to a few drops of the suspected essential oil, and shaking them together; for the spirit will dissolve all the oil that is essential, or procured by distillation, and leave all the expressed oil that was mixed with it untouched.

If an essential oil be adulterated with alcohol, or rectified spirit of wine, it may be done in any proportion, up to that of an equal quantity, without being easily discoverable either by the smell, or taste. The way to discover this fraud is to drop a few drops of the oil into a glass of fair water; and if the oil be adulterated with spirit, the water will immediately turn milky, and by continuing to shake the glass, the whole quantity of spirit will be absorbed by the water, and leave the oil pure at top.

Finally, if an essential oil be adulterated by a cheaper essential oil, this is commonly done very artfully: the method is to put fir-wood, turpentine, or oil of turpentine, into the still, along with the herbs to be distilled for their oil, such as

rosemary, lavender, origanum, &c.; and, by this means, the oil of turpentine distilled from these ingredients comes over in great quantity, and is intimately blended with the oil of the genuine ingredient. The oils thus adulterated always discover themselves in time, by their own flavour being overpowered by the turpentine smell; but the ready way to detect the fraud is to drench a piece of rag, or paper, in the oil, and hold it before the fire; for thus the grateful flavour of the plant will fly off, and leave the naked turpentine scent behind. Shaw's Lectures, p. 145.

The essential oils, as volatile oils are called by the Dublin college, are prepared in the following manner: let the oil be extracted by distillation from the substance previously macerated in water, as much water being added during the distillation as may be sufficient to prevent empyreuma. In distilling fennel, pepper-mint, spear-mint, penny-royal, and all-spice, the watery fluid that comes over in distillation with the oil is to be preserved for use.

OIL of Fennel Seeds. (See *ANETHUM Feniculum*.) Seventy-five pounds of fennel seeds yield thirty ounces of oil, which is colourless, and congeals at 50°. It has the odour of the plant and a sweet taste. The specific gravity is .997. The medical properties and use are the same with those of the plant. The usual dose is from \mathfrak{m} ij to \mathfrak{m} xx; but it is rarely used.

OIL, Fern. See *FERN*.

OIL, Granulated, is that fixed in little grains; this is the best, and most esteemed, especially of oils of olives.

OIL, Green, Oleum Viride, a form of medicine prescribed in the late London pharmacopeia, and made in the following manner: take leaves of bay, rue, marjoram, sea-worm-wood, and chamomile, each three ounces; oil of olives, a quart. Boil the herbs in the oil till they are crisp, and then strain off the oil; and when it has stood for the fæces to subside, put it up for use.

OIL of Hartshorn, Rectified, is prepared by the Dublin college in the following manner. Take of the oil which rises in the distillation of the volatile liquor of hartshorn, three pounds, and six pints of water. Distil the oil, then remix it with the water, and redistil, repeating the distillations until the oil becomes limpid. This oil should be kept in a dark place, in small phials completely filled and closely stoppered.

This empyreumatic oil is first formed by the decomposition of animal matter by heat; and arises from a new combination of part of the hydrogen and carbon of the substance distilled. When first obtained, it is thick, of a dark colour, and has a very offensive odour; but by the rectification prescribed, it is rendered thinner and less offensive. The rectified oil is nearly colourless and transparent; it has a strong, slightly aromatic odour, and a penetrating taste. It is very light and volatile, strikes a green colour with syrup of violets, is partially soluble in water, and unites readily with alcohol, ether, and oils. The acids form with it a thick saponaceous compound; and with the alkalis it forms a fine soap. Exposure to light and air destroys its transparency, and gives it a deep brown colour. As to its medical properties and uses, this oil is stimulant, antispasmodic, anodyne, and sudorific. It was formerly regarded as a remedy of much efficacy in fever, administered a few hours before the accession of the paroxysm of intermittents; and was also much employed in epilepsy, hysteria, and all convulsive affections: but it is now almost discarded from practice, being only used occasionally as an external application to paralytic limbs. The dose may be from \mathfrak{m} x to \mathfrak{m} xxx, in a sufficient quantity of water. Thomson's Lond. Disp.

OIL, Hempseed, is of a green colour, and strongly impregnated with the peculiar colour of this plant. The proportion of oil which hemp-seed affords is from 20 to 25 *per cent*. In its general properties, uses, and mode of preparation, it very much resembles linseed oil; which see.

OILS, Inflammability of. See *OIL, supra*.

• **OIL of Juniper, or of Juniper Berries.** (See *JUNIPERUS*.) Forty-eight pounds of berries yield six ounces of oil, of a specific gravity .611. In odour it resembles turpentine, and its taste is hot and acrid. It has a greenish-yellow colour, is viscid, and deposits a feculent matter when long kept. When genuine it is soluble in alcohol. This oil is carminative, diaphoretic, and diuretic. It is sometimes given in dropsy, and may be added to fox-glove, when it is exhibited in form of pills. The dose is from ℥ ij to ℥ x, combined with water by means of sugar or mucilage.

OIL of Lavender. (See *LAVANDULA*.) One pound and nine ounces of this oil are obtained from eighty pounds of lavender flowers. Its odour is very fragrant, and taste warm and agreeable; its colour is a pale lemon-yellow, and specific gravity .936. It is stimulant and cordial; and is chiefly used in hysteria and nervous head-ache, in doses from ℥ j to ℥ v, given on a lump of sugar. Its official preparation is unguentum sulphuris of the Edin. pharmacopeia.

OIL of Lead, is a solution of salt of lead in the essential oil of turpentine. This preparation is a powerful antiseptic.

OIL of Lemon, called the essence of lemon. (See *LEMON*.) This essential oil is chiefly used as a perfume to cover the smell of sulphur in ointments compounded with it. Its official preparations are spiritus ammoniæ aromaticus, unguentum sulphuris, and unguentum veratri.

OIL of Linseed. (See *LINSEED*.) The seeds of the common flax, consisting of a white kernel covered with a thin brownish shell, which cannot be separated from it, are submitted entire to the press; but if they are thus treated without any previous preparation, they yield a comparatively small quantity of oil, on account of a strong mucilage that resides in the shell, and absorbs a large proportion of the oil as it is forced out of the kernel. For this reason, and also because the cold-drawn oil is not so fit for the purposes to which this oil is generally applied, the mucilage is destroyed before the application of the press by the following method. An iron-vessel, like a sand-bath, and capable of containing some bushels, is fixed in a furnace; it is then filled with linseed, and heated by a moderate fire, the contents being carefully stirred from time to time, that every part may be equally roasted: at first there arises an abundance of aqueous vapour, which, as the heat is increased, is followed by dense blackish fumes of a very nauseous odour. When the torrefaction is completed, the paste is pressed in the mill in the usual way. The proportion of oil yielded by this trial is about 20 *per cent*.; its specific gravity is .9403: it is not congealed except by a cold below 0° Fahr., and its point of ebullition is about 600° of the same thermometer. The cold-drawn oil has a high yellow colour, is very unctuous and unpleasant both to the taste and smell: by exposure to the air and light it becomes dry. The hot-drawn oil is of a high yellowish-red, or deep wine colour, and is more nauseous than the former: it is of a thicker consistence, and dries without much difficulty in the air, more especially if it has been boiled with a little litharge. The great demand for this oil is in the coarser kinds of painting, particularly such as is not much exposed to the weather, as floor-cloths, &c. In medicine it is considered as emollient, demulcent, and slightly laxative; but as an

internal remedy it is seldom used, on account of its nauseous taste; though it has been given with advantage in ileus, when purgatives have failed. It is chiefly employed in the form of a glyster, in flatulent colic attended with costiveness, and in abrasions of the rectum; and it is an useful application to burns, especially when combined with lime-water. The dose, when taken by the mouth, is from f.ʒi to f.ʒj; but from f.ʒiij to f.ʒvj may be given at once, per anum. The official preparation is the linimentum aquæ calcis of the Edinburgh pharmacopeia, formed by mixing equal parts of linseed oil and lime-water. Aikin. Thomson.

OIL of Mace. See *MACE* and *NUTMEG*.

OIL of Marjoram. See *MARJORAM*.

OIL, Medullary. See *MEDULLARY System*.

OIL of Mercury, a solution of corrosive sublimate in spirit of urine. See *MERCURY*.

OIL of Mint. See *MENTHA*.

OIL of Mustard. See *Hedge MUSTARD*, and *SINAPIS*.

OIL of Myrrh. See *MYRRH*.

OIL of Nut. (See *NUT-OIL*.) As the walnut and hazelnut from which this oil is obtained, chiefly by cold-drawing, come to their full perfection in the warm climate of the south of Europe, they will yield, by proper management, full half their weight of oil. Recent cold-drawn nut-oil is preferred by many to olive-oil, on account of its retaining the exquisite flavour of the nut; the hot-drawn has an empyreumatic taste, and is no longer fit for the table: it is, however, much valued by the painter, as being eminently drying, much less coloured than linseed oil, and capable of bearing the injuries of the weather better than any other oil.

OIL of Nutmeg. See *NUTMEG*.

OIL of Olives is the most popular, and most universal of all other; being that chiefly used in medicine, in foods, fallads, and in the manufactures.

It is drawn from olives by presses or mills made for the purpose. The fruit is gathered when at its utmost maturity, in November, as it begins to redden: being put under the mill, as soon as gathered, care is taken that the mill-stones are set at such a distance that they may not crush the nut of the olive. The fleshy pulp, covering the nut or stone, and containing the oil in its cells, being thus prepared, is put into bags made of rushes, and moderately pressed; and thus is obtained a considerable quantity of a greenish semi-transparent oil, which, from its superior excellence, is called Virgin oil. The marc remaining after the first pressure is broken to pieces, moistened with water, and returned to the press, upon which there flows out a mixture of oil and water, which spontaneously separate by rest. This oil, though inferior to the former, is of a good quality, and fit for the table. The marc, being again broken to pieces, well soaked in water, and fermented in large cisterns, is again submitted to the press, by which is obtained a very considerable quantity of a third kind of oil, that is very valuable to the soap-boiler and other manufacturers. In some countries, particularly in Spain, the olives, instead of being gathered by hand, are beaten down, so that the ripe and unripe ones are mixed together, and to these are added such as have fallen of themselves, and are therefore more or less decayed. All these are thrown together in a heap, which soon ferments: the olives in this state are ground and pressed, and thus is procured with less trouble a large quantity of oil, of a rank disagreeable flavour, which none can bear but such as have been accustomed to it from their childhood. Recently-drawn Virgin oil has a bland almost mucilaginous taste, with a slight but

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agreeable flavour: when exposed to the air, in an open bottle or cask, a white fibrous albuminous matter is deposited, and the supernatant oil becomes clear and of a dilute yellow colour: and when this oil is poured off into another vessel, a second deposition occurs, and then the oil obtained, being put into clear glass phials, may be kept for a considerable time, without undergoing any change. But if the oil be allowed to stand on the white matter, it becomes in a few weeks very rancid; nor can the common oil, even under proper management, be preserved in casks longer than a year and a half, or two years at the farthest. The specific gravity of olive-oil is .9153; it boils at about 500° Fahrenheit, and congeals at 36° or 38° Fahrenheit. The facility with which it freezes renders it improper for lamps, especially in cold countries; but by previously exposing it in an open clear glass phial to the sun-shine, it may be so far amended in this respect, as to continue fluid at 21° Fahrenheit. Olive-oil is often sophisticated by a mixture of poppy oil, which renders it drying, a quality which the genuine oil does not possess. In countries that produce it, it is used for food, as butter is with us: that of the inferior kinds is burnt in lamps, or employed in the manufacture of soaps, which are of a finer quality than those that are composed of animal oils. The best oil is made in Provence; but that which we receive in this country is brought from Lucca and Florence. It is imported in jars, half-jars, and half-chefts, which are wooden packages containing flasks.

Olive-oil is used in medicine, internally, as a demulcent in catarrh and other pulmonary affections, diffused in water by means of mucilage; and it is also given, in large quantities, to mitigate the action of acrid substances, as some poisons, taken into the stomach; and in cases of worms, applied externally it is a very useful relaxant, and instead of stopping up the cutaneous exhalants, appears to promote the excretion of sweat, on which account it is beneficially employed in frictions at the commencement of the plague. The body is ordered to be very briskly rubbed all over with a clean sponge dipped in warm olive-oil, and the operation is repeated once a day until symptoms of recovery appear. Mr. Jackson relates, that the coolies, who are employed in the oil-stores at Tunis, smear themselves all over with oil, and are seldom afflicted with the plague when it rages in that city. Frictions with it are useful in ascites. It is also used as an injection in gonorrhœa; as an adjunct to glysters in dysentery and intestinal abrasions; and extensively in pharmacy, in the compositions of ointments and plasters.

The dose of olive oil is from f. ʒfs to f. ʒj, triturated with mucilage, or mixed with water by means of a few drops of solution of potash. In cases of poisons and worms, as much may be given as the stomach can bear. The officinal preparations of oil, besides cerates and ointments, are *Oleum sulphuratum*, L. E. *Linimentum ammoniæ fortius*, L. E. D. *Linim. ammoniæ carbonatis*, L. *Linim. calcis*, D. *Linim. camphoræ*, L. E. D. *Emplastrum plumbi*, L. E. D. *Emp. hydrargyri*, E. *Emp. oxidi rubri ferri*, E. *Enema catharticum*, D.

For the "*oleum sulphuratum*," see preparations of *SULPHUR*. For the liniments, see *LINIMENT*. For the plasters, see *EMPLASTRUM* and *PLASTER*. Aikin. Thomson.

OIL of Orange-peel. See *AURANTII Cortex*.

OIL of Origanum. See *MARJORAM*.

OIL, Palm, or Oil of Senegal, a thick unctuous liquor, of a yellow colour, and a violet smell; so called, because drawn, by ebullition, or by expression, from the fruit of a kind of palm-tree, growing in several places of Africa, especially in Senegal.

Many of the palms produce nuts, which abound in oil.

The principal of these are the *Cocos Butyracea*, and *ELÆIS guineensis*. The ripe fruit is collected in a heap, and slightly fermented; it is then coarsely pounded and macerated in hot water, and thus its oil is parted with and swims on the surface of the water, which by cooling concretes into a solid cake. It is purified by washing in hot water, and thus becomes fit for use. It has a light brown-yellow colour, little or no taste, but a high odour and flavour like those of the Florentine iris; by long keeping it becomes rancid, and is then nearly white, and almost without odour.

The Africans and the Negroes in the West Indies use this oil as we do butter; and burn it in their lamps when old. With us, it is only used in some external applications, for pains and weakness of the nerves, cramps, sprains, and other such complaints. The common people sometimes apply it to chilblains; and when used early, not without benefit. It is also employed in the composition of the best yellow soap. It is sometimes counterfeited with wax, oil of olives, iris, and turmeric; but the trick is found out either by air or fire. The air alters the colour of the genuine, and leaves the counterfeit unchanged; and, on the contrary, fire changes the counterfeit, but does not alter the genuine.

OIL of Penny-royal. (See *MENTHA Pulegium*.) This oil, which is of a reddish-yellow colour, resembles in its other qualities the oil of pepper-mint. Its specific gravity is .978. It is stimulant and antispasmodic, but seldom used. The dose may be from ℥ j to ℥ v, given on a lump of sugar.

OIL of Jamaica Pepper. (See *PIMENTO*.) This oil has the agreeable odour of the pimento, with its pungent taste augmented. Its colour is reddish-brown, and it is heavier than water. It has the same properties with the all-spice, but in a greater degree: it is given in dyspeptic affections, colic, and tympanitis, in doses of from ℥ ij to ℥ v, rubbed with sugar, or in any proper vehicle. Its officinal preparation is *emplastrum aromaticum* of the Dublin college. See *PLASTER*.

OIL of Pepper-mint. (See *MENTHA*.) This is a common domestic remedy in cramp of the stomach, flatulent colic, and anorexia; and usually rubbed up with sugar or mucilage. The dose is from ℥ j to ℥ ij. The officinal preparations are *pilulæ thei camp.* E. *Pilulæ aloes cum zingibere*, D.

OIL of Petrol. See *NAPHTHA* and *PETROLEUM*.

OIL of Pimento. See *PIMENTO*, and *OIL of Jamaica pepper*, *supra*.

OIL of Black Pitch. See *PITCH*.

OIL of Poppy-seed, or Pink-oil, is extracted by cold-drawing from the seeds of the large white poppy (*Papaver somniferum*), which is largely cultivated for this purpose in France, the Netherlands, and various parts of Germany. It is transparent and nearly colourless, and when well prepared, has no other taste or flavour, than a slight one of nut-kernels. Its specific gravity is .9288. This is one of the naturally drying oils, and like all of that class is frozen with difficulty; it may be cooled down to 0° of Fahr. without congealing. When employed as food, it is scarcely to be distinguished from olive-oil, which is often adulterated with it. The quantity of oil yielded by a given weight of the seeds depends partly on the country and season in which the seeds are produced, and partly on the mode of extracting the oil. From 100lbs. of fresh seeds, some state the produce of oil at 25lbs., and others at 58lbs. It is used as an article of diet, and in the composition of varnishes, but it is very unfit for burning in a lamp. See *PAPAYER* and *POPPY*.

OIL of Rape-seed. See *RAPE*, and *OIL of Cole-seed*.

OIL, Red, in the *Porcelain Manufacture*, a name given to a peculiar

a peculiar colour used on the china-ware, or to those pieces of the ware which are coloured with it. It is a very elegant ornament, and would be worthy our attempting to imitate in England, on our better sorts of wares. They do it in the following manner: they mix the red colour, called *tam-lan-hum*, or the copperas red (see PORCELAIN) with oil of *stone*, and with another oil, as they express it, of the same kind, made of a whitish sort of pebble, or agate, found on the shores of their rivers, and the place of which might probably be supplied with us by common crystal. The powder is to be thoroughly mixed with these liquors, and the vessel dipped carefully into the mixture, or some parts of it only covered with it in figures: after this, it is to be set by to dry, and, when thoroughly dried, it is to be baked in the common way. The general method is that of covering the vessel all over, both inside and out, with this red; and it comes out of the most bright and brilliant colour imaginable, but it will not ring when struck upon, as our common china-ware does. We seldom see this in any degree of perfection, but it is very elegant when fine.

OIL, Rock. See PETROLEUM.

OIL of Rosemary. (See ROSEMARY.) Twenty-four pounds of the plant yield one ounce of a fluid colourless oil, the odour of which is less agreeable than that of the plant. It deposits crystals of camphor when long kept. Its specific gravity is .934. As to its medical properties, it is stimulant, and frequently enters into the composition of liniments. The dose, as an internal remedy, may be from \mathfrak{m} ij to \mathfrak{m} vj; but it is scarcely ever ordered. The official preparations are tinctura saponis, and alcohol ammoniacum aromaticum.

OIL of Rue. (See RUTA.) Twenty-one pounds of rue yield 59 grains of oil, which has the strong ungrateful odour and taste of the plant. When recently drawn the colour is yellow, but it deepens into brown by age, and deposits a brownish resinous sediment. It congeals at 40° Fahr. Oil of rue is stimulant and antispasmodic; it is sometimes given in hysteria, and the convulsive affections of children attendant on dentition; and is also occasionally used as a rubefacient in palsy. The dose is from \mathfrak{m} ij to \mathfrak{m} v, triturated with sugar or mucilage.

OIL of Sage. See SAGE.

OIL of Sassafras. (See SASSAFRAS.) Sixty pounds of sassafras yield 12 ounces of a viscid yellow oil, heavier than water; its specific gravity being 1.094. Its odour is fragrant, and its taste hot and acrid, excoriating the lips when incautiously tasted.

The oil of sassafras is peculiarly liable to crystallization in certain circumstances, and that into the most beautiful forms. Mr. Maud gives an account of a quantity of this oil, which having stood exposed to the air in a very frosty night, in an open vessel, was in the morning found changed three parts in four of it into very beautiful and large crystals: they were of a hexagonal form, very transparent, and of three or four inches in length, and half an inch in thickness. These crystals subsided in water, and were indissoluble in it; they were readily inflammable at the fire, and were reduced by heat to their pristine fluid state: hence it is evident that they still retain the natural qualities of an oil, though they appear under so very different a modification of their parts. What is most remarkable in this change, is, the metamorphosis of a fluid to a solid body, of so determinate and regular a figure, and that these crystals should be perfectly clear and colourless, though the liquor from which they froze was of a yellowish colour, not unlike that of Madeira wine.

This oil is stimulant, and supposed to be also sudorific and diuretic. It has been given in chronic rheumatism, scurvy,

and some cutaneous affections. The dose is from \mathfrak{m} ij to \mathfrak{m} x, but it is scarcely ever ordered.

OIL of Savine. (See JUNIPERUS.) Two pounds of savine are said to yield five ounces of oil, which is limpid, of a pale yellow colour, having the odour of the plant, and being very acrid to the taste. This oil is the principle on which the virtues of savine depend; hence it possesses the same properties, and is applicable to the same purposes as the plant. The dose may be from \mathfrak{m} ij to \mathfrak{m} vj, triturated with sugar.

OIL of Spearmint. (See MENTHA.) The flavour of this oil is similar to that of pepper-mint, but less grateful; its taste is warm, and less pungent; its specific gravity is .975, and its colour greenish. Its medical properties are the same with those of oil of peppermint. The dose is from \mathfrak{m} ij to \mathfrak{m} v, given on a lump of sugar. Its official preparation is infusum menthæ compositum, which is prepared, according to the directions of the Dublin college, by taking of the leaves of spearmint, dried, two drachms, and a sufficient quantity of boiling water to afford six ounces by measure when strained; digesting for half an hour, but straining the liquor when cold, then adding of refined sugar two drachms, oil of spearmint, three drops dissolved in half an ounce (fluid?) of compound tincture of cardamoms; and mixing the ingredients. This is a grateful stomachic, and is slightly diaphoretic. It may be serviceable in anorexia and nausea, and as a vehicle to cover the disagreeable taste of other medicines. The dose may be from \mathfrak{f} . 3j to \mathfrak{f} . 3iij, or at pleasure.

OIL, Stillatitious. See STILLATITIOUS.

OIL of Stone. In the manufacture of the Chinese porcelain, they use a liquid matter of a white colour, which they call by this name, on which their great mystery of finishing their work depends; yet this has been less enquired into by the imitators of that ware in Europe than many other articles of less consequence. The stone of which this oil is made, is of the same degree of hardness with that which the petunse is prepared of. They procure it from quarries, and choose such as is of a good white colour, and has many dark green spots in it.

These spots are of the colour of the leaves of cypress. Sometimes a stone is chosen which has a brown ground, variegated with spots and blotches of a reddish colour. They first carefully wash this stone; then laying it in a clean place, they break it to pieces with iron instruments, and afterwards grind these to a perfectly fine and impalpable powder, by rubbing them in large mortars, with pestles of stone faced with iron, and turned either by the labourers, or by water. When the whole is thus reduced to a fine powder, they throw it into a vessel of water; and stirring it briskly about, they let the coarser part subside to the bottom, and there swims a fine thick matter like cream, for two or three inches depth on the surface. This they carefully skim off, and putting it into another vessel, of clear water, they let it throw down any coarse matter it may yet contain; and, finally, taking off the thick surface again, they mix this with some fresh water in another vessel, and leave it to subside; then pouring on the clean water, they take out the remainder at the bottom of the vessel, which is perfectly fine, and resembles a thick cream. To every hundred pounds of this they add one pound of a substance of the nature of which we are not yet perfectly informed. It is said to be a mineral resembling alum. They calcine this first, and then beat it to a fine powder; and this being added to the cream, or oil, as it is called, serves to keep it always in the same liquid state. This substance, when finished in this manner, has very little title to the name of an oil; it is rather a varnish, and is always used in mixture with another varnish, which

OIL.

is called at this time fern oil, and used to be called lime oil; it is prepared in the same manner with the other after burning. See FERN-Oil.

OIL of Sulphur is a name given to the concentrated acid of sulphur. See OIL, *supra*, and SULPHUR.

OIL of Tartar. See TARTAR.

OIL, Train. See WHALE FISHERY, TRAIN, and WHALE.

OIL of Turpentine is obtained by distilling the resin with water in a common still, when the oil is found in the receiver swimming on the water, from which it is easily separated. The average proportion is 60lbs. of oil from 250lbs. of good turpentine. This process is carried on both abroad and at home; but the oil drawn in this country is always preferred. (See PINUS, and TURPENTINE.) The Dublin college directs 5lbs. of turpentine and four pints of water, and the oil to be distilled from a copper alembic. Yellow resin will remain in the retort after the distillation.

The rectified oil of turpentine of the London and Dublin college is obtained from a pint (two pints Dub.) of oil of turpentine, and four pints of water. Distil the oil (a pint and a half of the oil, Dub.)

Purified oil of turpentine of the Edinburgh college is obtained from 1lb. of oil of turpentine, and 4lbs. of water; and distilling as long as any oil passes over. The rectification of the oil is a troublesome process, and on account of the great inflammability of the vapours, much caution is required to prevent them from escaping through the lutings of the vessels, and catching fire. The rectified oil is a little lighter than the common oil, and completely free from any resinous admixture; but in other respects it has no peculiar excellence to recommend it. What remains in the retort is a thick resinous matter, and is denominated "balsam of turpentine." (See BALSAM.) For the chemical and medicinal properties of oil of turpentine, see PINUS, TURPENTINE, and TAPE Worms.

OIL of Venus, a name given by Lemery to the salt formed by the union of copper with the nitrous acid, when it is resolved into a liquor by the moisture of the air. This is a caustic and escharotic.

OIL, Virgin, is understood of oils expressed from olives, nuts, &c. fresh gathered, without being heated, too much pressed, &c. See OIL of Olives.

OIL of Vitriol. See SULPHURIC Acid and VITRIOL.

OILS, Volatile. (See OIL, *supra*.) For the method of preparing these oils by the London college, see Distilled OILS, and for those of the Dublin college, see Essential OILS, *supra*. The Edinburgh college directs the volatile oils to be prepared in the same manner as the distilled waters, except that less water is to be added. Seeds and woody substances must be previously bruised or rasped. The oil distils over with the water, and, as it is lighter or heavier, floats on the surface or sinks to the bottom, and is afterwards separated. It is necessary to observe, in preparing these oils, and also the distilled waters, that the quality of the substances, their texture, the season of the year, and similar circumstances, must occasion so many differences, that no general rules, that are applicable to every case, can be laid down. Few of the volatile oils are prepared by the apothecary. The oils of anise, chamomile, juniper, origanum, rosemary, and pimento, are usually imported into this country; while those of lavender, peppermint, spearmint, and penny-royal, are annually prepared on a large scale.

As medical agents, volatile oils are stimulant and stomachic. They are chiefly employed to remove nausea and flatulence, to correct the griping qualities of some purgatives, and

the disagreeable taste of other remedies. They may be given triturated with water and mucilage; or dropped first on a lump of sugar, and through its medium diffused in water, forming a solution of what has been denominated "*oleum saccharinum*." The quantity of sugar must be more than ten times the weight of the oil; and when they are well triturated together the oil becomes thus completely soluble in water, and may be diluted to any extent. Some of the more stimulant of these oils are added to embrocations to be used as rubefacients in cases of numbness, pains, and paralytic affections of the joints. Thomson.

OIL of Wax. See WAX.

OIL frequently takes new names from the drugs mixed with it; as *oil of roses*, which is that mixed with roses; *oil of jessamy*, that perfumed with jasmine.

OIL of Wine. See ETHER.

OIL, Anointing with. See UNCTION.

OIL-Bag, a vessel in birds replete with an unctuous substance, secreted by one sometimes two glands, for the purpose, disposed among the feathers; which being pressed by the bill or head, emits its oily matter for dressing and pruning the feathers. See Anatomy of BIRDS.

OIL Beetle. See OIL BEETLE.

OIL-Bladders, in Vegetable Physiology. See Secretions of VEGETABLES.

OIL-Dregs. See DREGS.

OIL, Gilding in. See GILDING.

OIL, Painting in. See PAINTING.

OIL-Mill, in Mechanics, is a machine used to express oil from linseed, rape-feed, and other oleaginous grain, but chiefly from the above-mentioned for the use of painters. Olive and other vegetable oils, the produce of the south of Europe, are also expressed by a machine, but it is not called a mill, being simply a strong screw-press, provided with a windlass or capstan, to give it a greater power; in short, it is the same machine as the CYDER Press (see that article). The olives are first pounded, or bruised, either in a large mortar, or by a running stone, in the same manner as the apples for making cyder. The pulp thus produced is put up in bags made of horse-hair, and a pile of these, being made up under the press, the screw is forced down by men working at a long lever, and the oil expressed: it runs very freely at first, and this, which is esteemed the best quality, is in some countries kept separate. When this pressure has continued an hour or two, the power of the capstan is applied. This produces a good quantity of oil of the second quality, which is sold at an inferior price; and in some provinces of Spain, where the olive is extensively cultivated, it is used to burn in their lamps.

The oil-mill we intend to describe in this article is for a different purpose; viz. the expressing of linseed and rape-feed oils. These grains are exceedingly hard and smooth on their surfaces, and the fragments of their shells, however broken, form little concavities which will retain the oil, unless a far greater pressure is applied than can be obtained by a screw-press; it is, therefore, done by a wedge-press. This consists of a strong block of wood, or a cast iron frame, in which a long mortise is made: in this a bag of bruised seed is placed at each end, and blocks being put in to fill up the mortise, a wooden wedge is introduced between the blocks, and driven in by repeated blows of a heavy stamper, which is raised up by the power of the mill, and let fall upon the wedge, till it has driven it down as far as it will go. This causes a most immense pressure upon the seed contained in the bags, and forces out the oil at every blow of the stamper: for it is a curious fact that the same pressure,

OIL-MILL.

pressure, gradually produced, will not express any sensible quantity of oil; it must, therefore, be done by a sudden and violent accession of force; accordingly, at every stroke upon the wedge, the oil exudes in considerable quantity from the seed, until the whole is expressed, leaving a cake of seed as hard as a piece of board. These oil-cakes are very good food for cattle.

The machinery of an oil-mill is explained by the drawing in *Plate Oil-mill*, where *fig. 1.* is a plan, and *fig. 2.* an elevation, of a very good mill of this kind, which was erected after the designs of the late John Smeaton, esq. F.R.S.; whose proportions for the parts of mills have been scarcely improved since his time; though in the construction of the wheels, &c. cast iron has of late years been substituted for wood almost universally. A, in both figures, is the water-wheel actuating the whole mill; it is undershot; that is, the water passes under it, and turns the wheel, by its momentum striking upon the floats. (See *WATER-WHEEL*.) It works very close, in a pit formed between the two walls c, C, the latter being the outside wall of the mill-house: it is framed on a strong octagonal shaft B B, turning on two gudgeons fixed in its ends: D is the pit-wheel, or great cog-wheel, fixed upon the main shaft, within the house: it has wooden teeth fixed in its rim, parallel to its axis, in the manner of a crown-wheel. There are 80 of these teeth, by which it turns a smaller wheel, E, of 37 teeth, fixed on an horizontal shaft, F, called the tumbling shaft, extending nearly across the house. It gives motion to the stampers, V, W, of the prels, and also the rolling stones or runners, I, K, which bruise the feed. The latter is done by means of a wheel, G, with 35 teeth, fixed on the end of it, for the purpose of turning a large wheel, H, of 72 teeth, which is fixed upon a vertical shaft, n, which gives motion to the running stones, I, K. These are two circular stones, fitted upon an iron axle, the ends of which are shewn at a a. This axle passes through the vertical shaft m, and also through runners: thus they have two motions, a rotation round their own axis, by which they are carried round upon the nether or horizontal mill-stone, L, on which they roll. The centre-holes in these running mill-stones are made a little wide, and the hole in the shaft m, which carries the middle of the iron axis, is made oval up and down. This great freedom of motion is necessary for the runner mill-stones, because frequently more or less of the grain is below them at a time, and they must therefore be at liberty to get over it without straining the shaft.

The lower mill-stone, L, is supported on masonry, and surrounded by a border or ledge of wood d d, which prevents the feed being scattered: the two stones I, K, as the figure shews, are placed at different distances from the central axis m, so that they run in different paths, and thus bruise the feed more effectually than if they followed each other in the same circuit: n, n, are the ends of two wooden rails, projecting from the shaft m, and at their ends supporting two upright pieces of wood, which, at their inferior extremities, carry sweeps or rakes: these drag round upon the surface of the lower stone, and turn the feed about, to receive the greatest possible action from the stones I, K, rolling over it. There are two of these sweeps on the opposite sides of the stones, one called the outer rake, and the other the inner rake. The outer rake collects the grain under the runner from the surface of the border d. In this manner the grain is turned over and over, and crushed in every direction. The inner rake lays the grain in a slope or ridge, over which the runners pass, and crush it: then the second rake lifts it again into a ridge, to receive the action of the next stone, so that every side of the grain is presented to the runner mill-stone, and receives its action, while the rest of the lower stone is

swept by them so clean, that not a single grain is left on any part of it. The outer rake is also furnished with a rag of cloth, which rubs against the border of a hoop which surrounds the nether mill-stone, so as to drag out the few grains which might otherwise remain in the corners. There is also another sweep, making part of the inner rake, which is occasionally let down for sweeping off all the feed when it has been sufficiently bruised. The pressure and action of these rakes are adjusted by means of wooden springs, which cannot be easily and distinctly represented by any figure. The oblique position of the rakes (the outer point going foremost) causes them to shove the grain inwards, or towards the centre, and at the same time to turn it over somewhat in the same manner as the mould board of a plough shoves the earth to one side, and partly turns it over. Some mills have but one sweeper, and indeed there is great variety in the form and construction of this part of the machinery. The great pit, D, turns a small cog-wheel c, *fig. 1.* on whose spindle is fixed one of the two iron rollers f, g, which are used for bruising the feed, as in the first operation.

These rollers are made of cast iron, and truly turned in a lathe, their spindles turning in brass bushes, fixed in iron frames bolted down to the wood work. These frames have mortises in them, in which the bushes for the pivots of the roller, g, are placed, with liberty to slide in the mortises when they are pushed up by screws screwed through the ends of the iron frames. By these means the rollers can be set at any distance apart, according to the size of the feed which is to be crushed between them; l, l, are two small iron cog-wheels, of 15 teeth each, fitted on the ends of the pivots of the rollers; they make both rollers turn together with the same motion: the feed is put into a hopper, supported at some distance above the roller, and it runs out at an opening in the bottom into a trough called the shoe, which is continually shaken by means of a piece of wood nailed to it, and resting upon the cog-wheel l. By this means the shoe continually feeds the rollers with a small quantity of feed, without any danger of choking them up, and the seeds fall, from the end of the shoe, between the rollers, which, as they turn round, take the feed in between them, and bruise it. It is proper to have a piece of iron plate nailed to some part of the frame, and kept constantly pressing against the rollers, so as to scrape off the feed which may adhere to them. The feed, after having passed between the rollers, falls upon an inclined board, placed in the frame beneath them, and is thus shot down in a heap before the rollers, from whence it is conveyed by a labourer to the rolling stones.

The prels comes next to be noticed, for we have hitherto only described the machinery for bruising the feed previous to expressing the oil from it.

The tumbling shaft, F, has two lifters, M, N, projecting from it, which as it turns round lifts up and lets fall the stampers, V, W, of the prels. They rise and fall in a frame consisting of two thick pieces of wood P, P, firmly bolted together at the bottom by beams T, T, extended between them. The space between these beams is filled up by the bags of seed at d, d, *fig. 2.* the pressing wedge b, the discharging wedge c, and blocks of wood, to keep them at the proper distance apart.

The beams, T, T, have cross pieces upon them, between which the stampers, V, W, slide up and down: they are lifted up by the wipers or lifters M, N, fixed upon the shaft F: these take hold of tappets or chocks projecting from the stampers, and raising them to the proper height, let them fall on the wedges. When they are to be stopped, the workman pulls a rope, which raises a lever, and holds up the tamper too high to meet the lifter in its revolution. The
inverted

OIL-MILL.

inverted wedge, *c*, is suspended by a rope from a wooden spring, which raises it up, as in the figure, when the other wedge is taken out for the purpose of putting a fresh charge of seed in the bags at *dd*. The opening of the prefs, or the space contained between the uprights, *P, P*, of the frame, and the two beams *T, T*, has a very strong cast iron frame within it, which resists the pressure to rend the prefs open. The upper edge of this frame is shewn by the dark line in *fig. 2*, and the internal parts are shewn by dotted lines.

The bags of seed, *d, d*, are included between two iron plates, united together at the bottom in the manner of book lids, and the bag is shut up between them: immediately beneath these are small holes in the bottom of the prefs, at which the oil oozes out into small pots *k, k*: the blocks which fill up the prefs rest upon the bottom of the prefs, to prevent them being carried down by the action of the wedges which slide against them, having thin pieces of wood between, to make them slide easily by each other: the pressing wedge, *b*, has its point downwards, and is driven by the stamper *V*: the discharging wedge *c* is inverted, its smallest end being upwards; and this, when struck by the stamper *W*, is forced down, and thus releases the prefs, when it would be exceedingly difficult to disengage it by any other means, the pressing wedge being driven in very fast by the repeated blows of the stamper *V*.

There is likewise a small apparatus in an oil-mill called the fire gear or chauffer pan, which we have omitted in our plate. It is intended to keep the bruised seed stirring whilst it is heated in a copper pan, previous to pressing, as this is found to increase the produce of oil. The chauffer pan consists of a small fire-place, situated in the corner of the mill-house, and heated by burning charcoal in it. The seed is contained in a circular copper pan, which is set over the fire, and the seed is prevented from burning to the bottom of the pan, by a cross piece of iron fixed to the lower end of a vertical spindle, which, as it turns round in the pan, stirs the seed. The sides of this cross are set inclined, so as to scrape the seed from the bottom of the pan, and throw it over the back of the stirrer. The spindle for the stirrer is put in motion by means of a train of small wheelwork, receiving motion from a rigger or pulley fixed upon the tumbling shaft *F*, by means of an endless chain or rope. In many of the most improved mills the chauffer pan is heated by steam instead of charcoal: in this case it has a false bottom on which the seed lays, and the steam from a boiler is admitted into the space beneath the bottom. This is found to give the proper heat with greater precision than can be done (except by experienced workmen) with the charcoal fire; for if the heat is too great it makes the oil rancid, and if it is too low the produce of oil will be diminished. In either case the pan must have a small opening on one side, and a sluice to shut it up and keep in the seed until it is properly heated. Immediately beneath the door are two hoppers, which lead the seed down at the side of the furnace, and conduct it into the flannel bags, which are hung at the lower extremity, or small openings of the hopper. When the seed is sufficiently heated, and the prefs are ready for it, the sluice is opened, and the stirrer throws the seed out into the hoppers and the bags. These are made of flannel cloth, which is found the best substance to resist the pressure and admit the oil through. The bags, before they are put into the prefs, are flattened by the hand, and wrapped up in a long slip of very thick leather, which encloses it, and prevents the bag being burst by the pressure.

Our readers will now comprehend the structure of the oil-mill; but as in all operations of this nature much management is requisite to carry them on to the best effect, we

shall briefly describe the process followed by our most careful manufacturers of oil.

Linseed and rape-seed are the produce of almost every county in England, and as the consumption of the oil for painting is not confined to particular places, the manufacture is carried on in every part of the kingdom. A great number of oil-mills are to be met with in Hull, and other parts of Yorkshire, where they have the advantages of falls of water. The seed is first bruised between the rollers, to crack every grain without separating their parts: this very much facilitates the operation of the grinding, for the grains are so hard and smooth, that they slip away from beneath the runner-stones, and it would require a long time to get all the grains crushed; but by the rollers every grain is broken, and then the runner-stones act with proper effect. The rollers require so much power, that in small mills they cannot drive the other machines at the same time; but this is no objection to them, because they act with such rapidity, as in a very short time to bruise seed enough for the whole day's work. The seed, after being crushed between the rollers, is spread by a shovel upon the nether mill-stone *L*, to be ground by the runners. That this may be more expeditiously done, one of the runners is set about two-thirds of its own thickness nearer the shaft than the other. Thus they have different circuits, and the grain, which is a little heaped towards the centre, is thus bruised by both. The inner rake gathers it up under the outer stones into a ridge, over which the stone passes and flattens it: it is then gathered up again by the outer rake into a ridge under the inner stone. The outer rake consists of two parts; the outer part presses close on the wooden border *dd*, which surrounds the nether stone, and shoves the seed obliquely inwards, while the inner part of this rake gathers up what had spread towards the centre.

The outer rake has a joint near the middle of its length, by which the outer half of it can be raised from the nether stone, while the inner half continues pressing on it, and thus scrapes off the moist seed, which is like a paste. When the seed is sufficiently bruised, the miller lets down the outer end of the rake; this immediately gathers the whole charge, and shoves it obliquely outwards to the wooden rim, where it is at last brought to a part that is left unboarded, and it falls to the ground. In the Dutch mills it falls through troughs placed to receive it. These troughs have holes in the bottom, through which the oil drips all the time of the operation. This part of the oil is conveyed into a peculiar cistern, being considered as the purest of the whole, having been obtained without pressure, by the mere breaking of the hull of the seed.

The seed in this country is seldom so ripe as to yield any oil in this stage without pressure; but in some mills they take a quantity of their best seed from the stones, and putting it into bags give it a moderate pressure by a screw-press. The oil thus obtained is called cold drawn, and is sold at a higher price for the use of cabinet makers, who rub their ornamental wood work with it to give a polish: in other work, the cold drawn oil is nothing more than the first obtained by the prefs, but without heating the seed.

In some of the Dutch mills, a much greater quantity of oil is obtained in the grinding, without pressure, by having the bed of masonry, which supports the lower mill-stone, formed into a little furnace and gently heated. But the utmost care is necessary to prevent the heat from becoming considerable. This enabling the oil to dissolve more of the fermentable substance of the seed, exposes the oil to the risk of growing soon very rancid, and in general it is thought a hazardous

a hazardous practice, and the oil does not bring so high a price.

When the seed is very dry, a little water is thrown in among it whilst grinding, which is found to facilitate the process. In about twenty minutes a charge of seed will be sufficiently ground, and is then carried to the chauffer pan, where it is heated previous to being pressed. Here the stirrer keeps it from burning to the bottom of the pan: while this is doing the wedges of the prefs are taken out, both the stampers are hauled up, and the iron lids at *dd*, which are to include the bags of seed, are opened out ready to receive them. When the seed is sufficiently heated the sluice is opened, and the stirrer throws it out into the bags, the workman flattens them, wraps them in the leather, and puts them into their places. The wedge, *b*, is now introduced, and the stamper, *V*, disengaged to drive it down. After a few blows the oil begins to run, and this continues till the wedge gets so fast, that the stamper will rebound up from it two or three times: it is then judged that it can be driven no farther. The stamper, *V*, is now hauled up, and the other let loose. This at one or two blows drives down the wedge *W*, and relieves the pressure, after which the wedge and the bags may be taken out to put in a fresh charge. The contents of the bag are compressed into a dense cake, from which the bag is stripped off, and the cakes are ground up, and subjected to a second pressure. They are broken into pieces by the shovel, and thrown under the runners, where the cake is again broken down, and the parenchyma of the seed reduced to a fine meal. Thus free egrets is allowed to the oil from every vesicle in which it is contained. But it is now rendered much more clammy by the forcible mixture of the mucilage, and even of the finer parts of the meal. When sufficiently ground the workman conveys the paste to the chauffer pan, where it is heated rather more than for the first time, and the second pressure is conducted in the same manner as the first. The produce of oil from the second operation is very uncertain; as it depends upon a number of circumstances. It will sometimes exceed the quantity of the first time, and at other times it will not be half as much. The bags for the second pressure are filled with twice as much seed as the first time, and the cake will be more than twice as thick. The linseed cakes are sold at a high price for cattle, but the rape-seed cakes are ground to a coarse powder, and in that state sold for manure.

The mill shewn in our plate is on a small scale, but many mills have from 10 to 15 presses in use. A press will generally press seven cwt. of seed *per* day the first time, but only two, or two and a half cwt. for the second time, because it requires as much more time for the last operation.

Respecting the produce of oil from linseed, we have found from an average of four months work of an oil-mill in Yorkshire, that 280 quarters of linseed, generally weighing 30 stone (of 14lbs. each) *per* quarter, produced 5616 gallons of oil, which is at the rate of $20\frac{2}{3}$ gallons *per* quarter. The greatest produce in the period from which this average was obtained, was 409 gallons from 20 quarters, or $20\frac{2}{3}$ gallons *per* quarter. The least produce was 19 $\frac{1}{2}$ gallons *per* quarter.

OIL Stone, *cos olearia*, in *Natural History*, is a stone of a whitish colour, with a faint mixture of a bluish-grey; and it is sometimes ornamented with black spots and dendritic. It is of a moderately fine and compact texture, hard and heavy, and capable of a tolerable polish. It is not acted upon by acids, gives fire very freely with steel, and when burnt, acquires a pure white colour. This stone has not yet been found in England; but in the eastern parts, and in Germany, there are large strata of it. It is much used by

our artificers for setting a fine edge on their tools, and is only used with oil, which by degrees changes its colour to a deep brown. They call it the Turkey-stone. De Costa's Hist. of Fossils, p. 153.

OIL-Tree, in *Botany*. See **RICINUS**.

OIL Creek, in *Geography*, a river of America, in Alleghany county, Pennsylvania, which issues from a spring, on the surface of which floats an oil, similar to that called Barbadoes tar, and which runs into Alleghany river. The oil is found in such quantities, that a person may gather several gallons in a day. Those who have been affected with rheumatic complaints have found relief by bathing their joints in this oil; and the water drank freely, has operated as a cathartic.

OILS, in *Agriculture*, a provincial term used to signify the beards, or prickles of barley, &c.

OILY GRAIN, in *Botany*. See **SESAMUM**.

The sesamum, with oblong entire leaves, called the Eastern fox-glove, is much used by the Egyptians and African Negroes, both as food and medicine. The Arabians call the expressed oil of the seeds *zeid taib*, that is, good oil, by way of eminence, because it is of frequent use with meats; and in Egypt is sold dearer than oil of olives. Parkinson.

OILY Waters. See **WATERS**.

IOINGHT, or **YOINGT**, in *Geography*, a town of France, in the department of the Rhone and Loire; 7 miles W.S.W. of Villefranche.

OINTMENT, in *Pharmacy and Surgery*, &c. See **UNGUENT**.

QIRSEBECK, in *Geography*, a town of France, in the department of the Lower Meuse, and chief place of a canton, in the district of Maestricht. The place contains 803, and the canton 10,340 inhabitants, on a territory of 100 kilometres, in 14 communes.

OISE, one of the twelve departments of the second or northern region of France, formerly Beauvaisis, deriving its name from the river Oise, which joins the Seine, 5 miles S. of Pontoise. It is situated N. of the Seine and Oise, in N. lat. 49° 25', and bounded on the N. by the department of the Somme, on the E. by that of the Aisne, on the S. by the departments of the Seine and Marne, and Seine and Oise, on the W. by the departments of the Eure and the Lower Seine. It is 27 French leagues in length, and 18 in breadth, and contains 6082 $\frac{1}{2}$ kilometres, or 298 square leagues, and 369,086 inhabitants. It is divided into four circles, or districts, 35 cantons, and 738 communes. The circles are, Beauvais, comprehending 122,786 inhabitants; Clermont, 84,942; Compiègne, 88,048; and Senlis, 73,310. According to Haffenfratz, the circles are 9, the cantons 76, and the number of inhabitants 385,206. The capital is Beauvais. The contributions, in the 11th year of the French era, amounted to 4,714,895 fr. and the expences to 293,983 fr. 33 cents. The soil in this department, consisting of plains and eminences, is of different qualities, but in general is fertile, yielding grain, flax, pasture, &c.

OISEAU, in *Conchology*, the name of a peculiar species of oyster, of so remarkable a figure, that it represents a bird, with its wings expanded, and has a small protuberance at the hinge, representing a head, and a long process at the opposite end, which very well represents a tail. It is of a dusky reddish colour on the outside, and of a fine pearly hue within. When the outside of this shell is taken off, and it is nicely coloured, by cutting it down to a proper depth in every part, it is of a fine reddish yellow, and is the aurora shell of collectors.

OISEL, **JAMES**, in *Biography*, professor of law at Groningen,

ningen, was born at Dantzic in 1631, and died in 1686. His works are corrections and notes on various authors, a treatise entitled "Thesaurus selectorum Numismatum antiquorum ære expressorum," and a "Catalogue" of his library, which was large and valuable. Moreri.

OISELE, in *Geography*, a town of Westphalia, in the bishopric of Osnabruck; six miles E.S.E. of Osnabruck.

OISEMONT, a town of France, in the department of the Somme, and chief place of a canton, in the district of Amiens; 21 miles W. of Amiens. The place contains 1030, and the canton 10,339 inhabitants, on a territory of 165 kilometres, in 35 communes.

OISTER, in *Zoology*. See OYSTER.

OISTER'S Town, in *Geography*, a town which stands on a bay, to which it gives name, near the southern extremity of the island of Barbadoes, formed to the S.E. by Kendal's point, and well defended by forts; four miles E.S.E. of Bridgetown.

OISY, a town of France, in the department of the straits of Calais; eight miles S. of Douay.

OITAMA, a town of Japan, in the island of Nippon; 25 miles N.W. of Mogani.

OITS. See OMI.

OKA, or OKKA, a river of Russia, which rises in the government of Orel, and after watering that and the governments of Kaluga, Tula, Mosco, Rezen, Tambow, Vladimir, and Nishnei-Novgorod, falls at the city of the last-mentioned name into the Volga. This is a very considerable river, navigable to its upper regions, taking up a multitude of smaller streams, and thus effecting an excellent communication between most of the inland governments of the empire. On its left it receives the Ugra, the Moskva, and the Kliasma; and on its right, the Upa, the Osetr, and the Moskha.—Also, a river of Russia, which runs into the Angara, near Bratskoi. N. lat. $56^{\circ} 5'$. E. long. $101^{\circ} 40'$.

OKAKEE, a town of America, in Virginia; 10 miles S.W. of Dumfries.

OKAMUNDEL, a circar of Hindoostan, in Guzerat, on the S. side of the gulf of Cutch. The chief town is Nonagur.

OKANDA, a town of Japan, in the island of Nippon; 55 miles E. of Jedo.

OKANDE, a town of Ceylon, on the E. coast; 24 miles S. of Trincomaly.

OKASAKI, a town of Japan, in the island of Nippon. N. lat. $35^{\circ} 40'$. E. long. 138° .

OKE, an Egyptian weight, consisting of three rotolos, each of twelve ounces, at twelve drachms to the ounce, and sixteen carats to the drachm.

OKEHAM, in *Geography*. See OAKHAM.

OKEHAMPTON. See OAKHAMPTON.

OKEISUT, a cape on the W. coast of West Greenland. N. lat. $61^{\circ} 48'$. W. long. $50^{\circ} 3'$.

OKELAS, in Egypt, and some other of the eastern countries, are a sort of indifferent buildings round a court, and commonly appropriated to the merchants of some particular country, with their goods; as at Cairo, there is one for the merchants of Nubia, and the black slaves, and other goods they bring with them; and another for white slaves from Georgia.

OKER. See OCHRE.

OKERAH, in *Geography*, a town of Bengal; 43 miles N.W. of Burdwan. N. lat. $23^{\circ} 49'$. E. long. $87^{\circ} 20'$.

OKI, an island of Japan, about 60 miles in circumference, near the N.W. coast of Nippon. N. lat. $35^{\circ} 50'$. E. long. $133^{\circ} 30'$.

OKIANOW, a town of the duchy of Warsaw; 20 miles N. of Warsaw.

OKILPOUR, a town of Hindoostan, in Bengal; 20 miles S.E. of Mauldah.

OKLANDBEIG, a town of Norway, in the province of Aggerhuus, on the Glomme; eight miles S. of Christiana.

OKLANSK, a town of Russia, near the gulf of Penzinskaja. N. lat. $63^{\circ} 30'$. E. long. $163^{\circ} 44'$.

OKMIANY, a town of Samogitia; 28 miles N. of Medmiki.

OKNA, a town of European Turkey, in Moldavia; 44 miles S. of Niemez.

OKOLSKI, in *Biography*, a Dominican, was a native of Russia, and became provincial of his order in Poland in 1649. He published, in 1641, at Cracow, a work entitled "Orbis Polonus," in three volumes folio, being a history of the Polish nation, with learned researches concerning the origin of the Sarmatians. The work is very rare, and of high value. He was author also of a work entitled "Pæco divini verbi Albertus episcopus Ratiponenis."

OKONE, in *Geography*, a town of East Florida, on the Ashley. N. lat. $50^{\circ} 10'$. W. long. $84^{\circ} 16'$.

OKOTSK. See OCHOTSK.

OKOTSKOI, or OKHOTSKOI. See OCHOTSKOI.

OKRAH, a town of Hindoostan, in the circar of Gurrah; 10 miles N. of Mahur.

OKSOR. See ACSOR.

OKU-JESSO, signifying Upper Jesso, or North Jesso, an island on the coast of Tartary, separated from Jesso by a strait, and peopled by inhabitants who have the same origin with the Kuriles, though it lies 150 leagues to the westward of the Kurile islands. It is the same island with that which is called *Segalien* and *Tchoka*; which see.

OKULOKA, a town of Russia, in the government of Archangel, on the river Pinega; 180 miles S.E. of Archangel.

OKUNEVO, an ostrog of Russia, in the government of Tobolsk, on the Enisei or Yenisei. N. lat. $69^{\circ} 25'$. E. long. $87^{\circ} 24'$.

OKUNEVSK, a town of Russia, in the government of Tobolsk, on the Mijas; 200 miles S.W. of Tobolsk. N. lat. $55^{\circ} 40'$. E. long. $63^{\circ} 54'$.

OKUS, a bay on the W. coast of the island of Ximo, N. of Nangafaki.

OLABUS, in *Ancient Geography*, a town of Asia, in Mesopotamia, situated on the left bank of the Euphrates.

OLAF, in *Biography*, king of Norway in the 10th century, sent missionaries into Greenland to convert the inhabitants of that country to Christianity.

OLAHUS, NICHOLAS, a learned prelate, who flourished in the 16th century, was born of an ancient family at Hermanstadt in 1493. Being brought up to the ecclesiastical profession he obtained various instances of preferment, till at length he was nominated by Ferdinand, king of Hungary, bishop of Zagrat, and chancellor of the kingdom. He was afterwards elevated to the see of Agria, and in that character was present at the famous siege of that town by the Turks in 1552, in which he contributed greatly, by his liberality and exhortations, to the spirited and successful defence made by the inhabitants. In 1553 he was appointed archbishop of Strigonia, and during the fifteen years in which he occupied this station, he assiduously attended to the interests of religion and morality. He held two national councils at Tyrnau, the acts of which were printed at Vienna in 1560. It was chiefly through his munificence that the first Jesuits' college in Hungary was founded at Tyrnau. In

1562 he was created palatine of the kingdom, in which quality he crowned Maximilian as king of Hungary. He died at Tyrnau in 1568; leaving behind him, as monuments of his industry and learning, "A Chronicle of his own Times;" "A History of Attila," and "A Description of Hungary."

OLAM, in *Geography*, a river which rises in Thibet, and entering into the province of Chen-fi, in China, changes its name into Tai-tong, and finally loses itself in the Hoang. N. lat. $36^{\circ} 10'$. E. long. $102^{\circ} 44'$.

OLAND, a small island of Denmark, in the North sea; eight miles N. of Nordstrand.

OLANE, in *Ancient Geography*, a town of Asia, in the mountains of the Greater Armenia, and in the vicinity of Artaxata. Strabo.

OLANGO, in *Geography*, a small island among the Philippines, near the E. coast of Siba. N. lat. $10^{\circ} 33'$. E. long. $123^{\circ} 51'$.

OLANOW, a town of Poland, in Volhynia; 28 miles S.W. of Berdiczow.

OLAN-POULAC, a town of Thibet; 75 miles N. of Haralope-pai.

OLARGUES, a town of France, in the department of the Herault, and chief place of a canton, in the district of St. Pons; seven miles N.E. of St. Pons. The place contains 1037, and the canton 9272 inhabitants, on a territory of $312\frac{1}{2}$ kilometres, in 12 communes. N. lat. $43^{\circ} 33'$. E. long. $3^{\circ} 0'$.

OLARTE, FR. DIEGO DE, in *Biography*, "was," says Mr. Southey, "a townsman and servant of Cortes, whom he accompanied to Mexico, and bore his share in the guilt and the glory of that wonderful, but atrocious conquest. Olarte, however, enjoyed none of the spoils; and made the best atonement he could to the Mexicans, by entering the Franciscan order, and living the life of a missionary among them forty years, inflicting upon himself during all that time penances, which proved the sincerity of his contrition." He was one of the most successful missionaries, and best loved by the natives. At different times he was guardian of the convent at Mexico, definitor of the province, and afterwards provincial. In 1567, the visitors whom Philip II. sent to proceed against the rebels, ordered him to Spain as a suspected person; he cleared himself satisfactorily of the charge, and returned with the rank of comisario-general of New Spain. But the fatigue of the voyage, and the anxiety which he had undergone, was too much for his old age, and he died shortly after his return in 1569.

OLASH, in *Geography*, a town of Asiatic Turkey, in the government of Sivas; 10 miles S. of Sivas.

OLASSGUNGE, a town of Hindoostan, in Bahar; 32 miles S. of Patna. N. lat. $25^{\circ} 5'$. E. long. $85^{\circ} 20'$.

OLAVIDES, the Count de, in *Biography*, was born in Spanish America, but had his education at Madrid, where he was secretary to the count de Aranda, whom he accompanied in his embassy to France. On his return to Spain Charles III. created him count, and appointed him to the office of superintendant of Seville. He undertook the great work of fertilizing the Sierra Morena, or Black Mountain, a completely desert region. By his perseverance, and with the aid of the colonies of Germans which he carried thither, it assumed a new face. Notwithstanding the benefits which he had thus rendered his country, he fell into disgrace, and was sent to prison, from whence he effected his escape to Venice, where he died at the age of sixty-five. A work entitled "El Evangelio en Triunfo," or "The Triumph of the Gospel," in four volumes, 4to. is attributed to him.

OLAX, in *Botany*, so called, as Linnæus, the author of

the name informs us, from $\omega\lambda\alpha\zeta$, a furrow, but how it applies to the plant we are not informed; nor is the difficulty of the question lessened by the name being ranged, in *Phil. Bot.* 184, among those which allude to the medicinal effect of the plants that bear them.—Linn. Gen. 22. Schreb. 29. Willd. Sp. Pl. v. 1. 185. Vahl. Enum. v. 2. 33. Mart. Mill. Dict. v. 3. Brown. Prodr. Nov. Holl. v. 1. 357. Juss. 153. Gært. t. 179. (Fissilia; Juss. 260. Willd. Sp. Pl. v. 1. 194. Lamarck Illustr. t. 28. Spermaxyrum; Labillard. Nov. Holl. v. 2. 84.)—Class and order, *Triandria Monogynia*. Nat. Ord. *Sapotæ*, Juss. *Santalaceæ affine*, Brown.

Gen. Ch. Cal. Perianth inferior, of one leaf, hemispherical, undivided, entire, permanent. Cor. Petals fix, combined in pairs by means of the fertile stamens, oblong, obtuse, equal. Stam. Filaments three, alternate with, and combining the petals, short; anthers heart-shaped erect; barren filaments fix, longer, mostly forked, one inserted into the middle of each petal. Pist. Germen superior, roundish; style thread-shaped, shorter than the corolla; stigma obscurely three-lobed. Peric. Drupa enclosed in the coloured calyx. Seed. Nut crustaceous, of one cell.

Eff. Ch. Calyx undivided. Petals fix, cohering in pairs by the stamens. Barren filaments fix. Drupa invested with the enlarged calyx.

Obs. The petals are, in some cases, but five, and therefore vary in their degree or mode of connection. Mr. Brown observes that the New Holland species have the barren filaments simple, not forked, and only five petals, one of which is not connected with the rest. The flowers are sometimes polygamous.

1. *O. zeylanica*. Linn. Sp. Pl. 48.—Leaves ovate, pointed, smooth on both sides. Branches angular.—Native of Ceylon. We received a specimen from the late professor Van Royen, but there is none in the Linnæan herbarium, nor do we find any figure of this species. The branches are smooth, long and wavy, obscurely angular, of a tawny brown. Leaves alternate, on short stalks, ovate, pointed, entire, wavy, smooth on both sides, about two inches long, with one rib and several fine transverse veins. Flowers in little axillary forked panicles, quite smooth in every part. Vahl describes the leaves as nearly destitute of veins.

2. *O. scandens*. Roxb. Coromand. v. 2. 2. t. 102.—Leaves elliptical, obtuse; downy beneath. Calyx minutely fringed.—Native of forests on the coasts of Coromandel, flowering all the year round. Trunk inclining, often as thick as a man's thigh. Branches long, climbing, or trailing, round and downy when young. Leaves about the size of the last, but elliptical, two-ranked, soft and downy beneath, becoming smooth by age. Flowers in short axillary clusters, whitish small. Fruit yellow, pulpy, invested with the enlarged, coloured, but scarcely pulpy, calyx.

3. *O. psittacorum*. Vahl. Enum. v. 2. 33. (Fissilia psittacorum; Lamarck Illustr. 102. t. 28.)—Leaves elliptic-lanceolate, very smooth. Branches round. Gathered by Commerçon in the isle of Bourbon, and by Koenig in Ceylon. A bushy tree, with round, smooth, rather zigzag branches. Leaves on very short stalks, smooth and even, rather coriaceous, nearly two inches long. Flowers larger than in either of the foregoing. Vahl describes five petals, one of which is unconnected with the rest. The drupa is the size of a currant, partly covered by the apparently fleshy calyx, not unlike the fruit of the Yew, at least in shape.

4. *O. Phyllanthi*. Brown. n. 1. (Spermaxyrum Phyllanthi; Labill. Nov. Holl. v. 2. 84. t. 233.)—Leaves elliptical, emarginate. Stalks single-flowered.—Native of the south coast of New Holland. A shrub about six feet high,

with numerous round branches. *Leaves* nearly sessile, about half an inch long, of a broad elliptical figure, with a notch at the end, smooth. *Flowers* axillary, solitary, on simple stalks, shorter than the leaves, some male, others female, with a few united ones, all on the same plant. Labillardiere describes the fruit as a *capsule*, bursting elastically towards the top, and invested with the calyx. The cracked *drupa* might, when dry, have the appearance of a capsule.

5. *O. striata*. Brown n. 2.—“Leaves oblong-linear, with a small point. Stalks single-flowered.”—Found near Port Jackson, New South Wales.

6. *O. aphylla*. Br. n. 3.—“Leaves none. Spikes polygamous.”—Gathered by Mr. Brown in the tropical part of New Holland.

OLAYOON, in *Geography*, a town of Hindoostan, in the Carnatic; 15 miles S.E. of Trichinopoly.

OLBA, in *Ancient Geography*, a town of Asia, in Cilicia Trachea, or mountainous Cilicia, at a certain distance from the sea, in the country called “Ketida,” inhabited by the “Kennati,” who were subject to the sovereigns of Olba. Some medals of this ancient place inform us that Olba had the title of *ιερα*, or sacred; and that Polemon, one of the sovereigns of Olba, took the name of Marc Antony, in honour of this Roman. It was in the year of Rome 713, that Aba received from Antony the principality of Olba, an epocha at which Antony and Cleopatra sojourned in Cilicia. In process of time the head of Augustus was found on some medals of Olba. The territory of Olba seems to have been both extensive and fertile; it was watered by many streams, and produced plenty of vines and fruit-trees. Under the lower empire Olba comprehended the province of Isauria, and became an episcopal see; but from the time of Heraclius, it belonged to the district of Seleucia.

OLBASA, a town of Asia, in Pisidia.—Also, a town of Antiochan Cappadocia. The name was also assigned to three towns in Asia Minor.

OLBEGO, in *Geography*, a town of Spain, in Old Castile; 20 miles S. of Soria.

OLBERSDORF, the chief town of a lordship in Silesia, in the principality of Jagerndorf; seven miles N.W. of Jagerndorf. N. lat. $50^{\circ} 16'$. E. long. $17^{\circ} 44'$.

OLBIA, in *Ancient Geography*, a maritime town on the E. coast of the island of Sardinia; with a port. It was built by the Greeks according to Pausanias, and as Florus says, ravaged by Scipio.—Also, a town situated in the southern part of Sardinia; built, says Livy, by Iolaus.—Also, a town of Gallia Narbonensis, on the sea-coast; founded by the Marfilians, over-against the Stecades islands, where they kept a garrison to guard against pirates.—Also, a town of Sarmatia, called Olbiopolis and Miletopolis, now “Kezikirman,” situated at the confluence of the Hypanis and Borysthenes. It was a colony of Milesians.—Also, a town of Asia, in Bithynia, called “Oliba,” on the rivers of the Propontide.—Also, a town of Asia, in Pamphylia, on the confines of Lycia.

OLBROM, in *Geography*, a town of Poland, in the palatinate of Cracow; 28 miles N.N.W. of Cracow.

OLBY, a town of France, in the department of the Puy de Dôme; nine miles W.S.W. of Clermont.

OLCADES, in *Ancient Geography*, a people who occupied the interior of Hither Spain; their territory was extensive, and lay to the south of the Carpetani.

OLD AGE. See AGE, and LONGEVITY.

OLD Astronomy. See ASTRONOMY.

OLD Buffs, in *Military Language*, a name given to the third regiment of foot. This regiment was put on the regular establishment of the army in the year 1665, and de-

nominated the “Buffs,” from being the first whose accoutrements were made of leather prepared from the buffalo, after the manner of shamoy. The waistcoats, breeches, and facings of the coat were afterwards directed to be made of a corresponding colour. When other regiments assumed this part of their appointment, the third acquired the name of the “Old Buffs.” This regiment has the privilege (and we believe exclusively) of marching through the city of London by beat of drum. Whether it derived this privilege from having exerted itself in the protection of the city, or from having, as has been vaguely reported, been at first composed of men who belonged to the train band, we cannot ascertain. The uniform is red, with buff facings, buff waistcoats and breeches. The thirty-first regiment, which has the same uniform, is commonly called the “Young Buffs.”

OLD Imposition of Tonnage. See DUTY.

OLD Man's Beard, in *Botany*. See CLEMATIS.

OLD Milk, in *Rural Economy*, a provincial word signifying skim-milk.

OLD Style. See STYLE.

OLD Subsidy. See SUBSIDY.

OLD-Wife Fish, in *Ichthyology*, a name by which a species of balistes is called in several of our plantations. See ACARAUNA.

OLD-Wife is also a name given to the wrasse, a species of labrus.

OLD Works, in *Mining*, are such that are either fallen in or stand unwrought.

OLD Fort Bay, in *Geography*, a bay on the S. coast of Canada, on the river St. Lawrence. N. lat. $51^{\circ} 26'$. W. long. 58° .—Also, a bay at the S. end of the island of St. Lucia.—Also, a cluster of small islands in the gulf of St. Lawrence. N. lat. $51^{\circ} 20'$. W. long. $57^{\circ} 45'$.

OLD Cape François, forms the N. point of Cosbeck bay, on the N.E. part of the island of St. Domingo; five leagues E. of Cape de la Roche. N. lat. $19^{\circ} 40' 30''$.

OLD Harbour, a bay on the S. coast of Jamaica, W. of Port Royal, having many shoals and islands at its entrance.

OLD Head, a cape on the S.E. coast of Ronaldsha, one of the Orkney islands. N. lat. $58^{\circ} 37'$. W. long. $2^{\circ} 47'$.

OLD Man, a cape on the W. coast of Africa. S. lat. $14^{\circ} 40'$.

OLD Man's Bay, a bay on the S. coast of Newfoundland; 80 miles E. of Cape Ray.

OLD Man's Creek, a river of New Jersey, which discharges itself into the Delaware, and separates the counties of Salem and Gloucester.

OLD Man's Port, lies northward of Lima river, in Peru; eight or nine miles N. of Cadavayllo river.

OLD Nabb, a cape of England, on the coast of Yorkshire; nine miles N.W. of Whitby.

OLD Peak, a cape of England, on the coast of Yorkshire; nine miles N.N.W. of Scarborough.

OLD Road, a town and harbour in the island of Antigua.

OLD Town, a town of the state of New York, on Staten island; 12 miles S.W. of New York.

OLD Road Town, a town of the island of St. Christopher, in a bay that has from five to fifteen fathoms of water near the shore; five miles W. of Basse Terre. N. lat. $17^{\circ} 25'$. W. long. $62^{\circ} 48'$.

OLD Town, a town of the state of Georgia; 16 miles S.S.E. of Louisville.

OLD Town Creek, a river of North Carolina, which runs into Cape Fear river. N. lat. $34^{\circ} 8'$. W. long. $78^{\circ} 9'$.

OLD

OLD Town, a town of Maryland, in Alleghany county, on the N. bank of Patomac river; 14 miles S.E. of Cumberland. N. lat. $39^{\circ} 38'$.—Also, a town of North Carolina, near Brunswick.—Also, an Indian town, in one of the 54 islands reserved by the Indians for their use in Penobscot.

• **OLDCASTLE**, Sir JOHN, in *Biography*, frequently denominated the good lord Cobham, was born in the reign of Edward III., and is said to have been the first author, as well as the first martyr, among the English nobility. He obtained his peerage by marrying the heiress of a lord Cobham who opposed the tyranny of Richard II. He was one of the leaders of the reforming party, and was at great expence in procuring and dispersing copies of Wickliffe's writings among the people, as well as by maintaining a number of his disciples as itinerant preachers. In the reign of Henry V. he was accused of heresy, the growth of which was attributed to his influence. Being attached to the court, the king delayed his prosecution, that he might reason with him himself, but not being able to reclaim him to the church of Rome, he, in great displeasure, resigned him to its power. He was accordingly singled out as a proper victim of ecclesiastical severity, whose punishment it was thought would strike a terror into the whole party, and teach them they must expect no mercy. He was indicted at the instance of Arundel, archbishop of Canterbury, who, with the assistance of the bishops of London, Winchester, and St. David's, condemned him to the flames, on account of his erroneous opinions. Lord Cobham, who was confined in the Tower, made his escape before the day appointed for his execution. He retired into Wales, where he lay concealed for four years. He formed, in his retreat, a plan to seize the king. Eltham was the place at which the plot was to be executed; Henry was apprized of the fact, and immediately removed to Westminster; Cobham was not discouraged by the disappointment, but changed the place of rendezvous to a field near St. Giles's. The king now had recourse to offensive measures, caused the gates of the city to be shut, to prevent any reinforcement of the Lollards, as they were denominated, from that quarter, came into the field in the night-time, seized such conspirators as appeared, and took prisoners many others whom he apprehended on their road. Cobham himself again made his escape, but was afterwards taken, when he was hanged as a traitor, and his body was burnt on the gibbet, in execution of the sentence pronounced against him as a heretic. He wrote "Twelve Conclusions, addressed to the Parliament of England."

OLDCASTLE, in *Geography*, a small post-town of the county of Meath, Ireland; 41 miles N.W. from Dublin.

OLDE, or **HOLD**, a town of Germany, in the bishopric of Munster; 20 miles S.E. of Munster.

OLDEN, a town of Norway, in the province of Bergen; 95 miles N.N.E. of Bergen.

OLDENBROECK, a town of the duchy of Bremen, at the mouth of a small river, which runs into the Elbe; 27 miles N.W. of Stade. N. lat. $53^{\circ} 52'$. E. long. $8^{\circ} 39'$.

OLDENBURG, HENRY, in *Biography*, a learned German in the seventeenth century, was descended from the counts of Aldenburg in Westphalia, and born in the duchy of Bremen, in Lower Saxony, about the year 1626. During the time of the Long parliament in the reign of Charles I. he came to this country in the character of consul, a post which he continued to occupy under the administration of Cromwell. Afterwards he accepted the office of tutor to lord Henry O'Bryan, a young Irish nobleman, whom he attended to the university of Oxford; and in 1656 he entered

himself student in that university, in order that he might have an opportunity of consulting such books as he wanted, chiefly in the Bodleian library. He was some time after this appointed tutor to lord William Cavendish, and became the intimate acquaintance and friend of the illustrious John Milton, who addressed to him four letters in his "Epistolæ Familiæres." He was elected one of the earliest members of the Royal Society, and was afterwards chosen assistant secretary to Dr. Wilkins. No sooner had he undertaken this office, than he applied himself to the several duties attached to his office with the utmost assiduity and zeal, and published the first number of the "Philosophical Transactions." He established a correspondence with more than seventy persons, in different parts of the world, on a vast variety of subjects. The method which he contrived to get through his business was to proceed in his work by the most simple mode; he never read a letter until he had before him, pen, ink, and paper, ready to answer it forthwith, so that the multitude of his letters never wearied him, nor ever lay heavy on his hands. He was the constant correspondent of Mr. Robert Boyle, and translated several of that philosopher's works into the Latin language. In 1675 Mr. Oldenburg became involved in a dispute with Mr. Hooke, who complained that justice had not been done him in the "Transactions," with respect to the invention of the spiral-spring for pocket watches. The discussion was terminated in favour of Mr. Oldenburg, by a declaration from the council of the Royal Society, "that the publisher of the Transactions had carried himself faithfully and honestly in the managing the intelligence of the Royal Society, and given no cause for such reflections." Mr. Oldenburg continued to publish the Philosophical Transactions till the number 136, in the year 1677, after which the publication was discontinued, till it was resumed by Dr. Nehemiah Grew. Mr. Oldenburg died in August 1678, at the age of fifty-two. He published numerous tracts, chiefly on theological subjects, and translations of the "Prodromus to a Dissertation concerning Solids naturally contained within Solids, &c. by Nicholas Steno:" of "A Genuine Explication of the Book of Revelations, &c. by A. B. Piganius;" and of "The Life of the Dukes of Mazarine."

OLDENBURG, in *Geography*, a county of Germany, bounded on the N. by the lordship of Jever, on the E. by the county of Delmenhorst and the Weser, on the S. by the bishopric of Munster, and on the W. by East Friesland. This county measures 40 miles in length, and somewhat more than 30 in breadth, and belongs to the king of Denmark. The soil, generally fertile, affords excellent pasturage, and a good breed of horned cattle and horses. It has, however, much moor-land, which is dug for good turf that is used for burning. Large and expensive dykes and dams secure it against inundations. Amber has been found in some parts of it.—Also, the capital of the above county, seated on the Hunte, regularly fortified, and containing two churches. The citadel is the residence of a governor; 39 miles E.S.E. of Emden. N. lat. $53^{\circ} 7'$. E. long. $8^{\circ} 15'$.—Also, a town of Westphalia, in the bishopric of Paderborn, with a fortified castle; 16 miles E.N.E. of Paderborn.

OLDENBURGER, PHILIP-ANDREW, in *Biography*, a jurist and political writer, was settled at Geneva, where he taught law and history with much reputation. He wrote a great number of very learned works, several of which he published under borrowed names. One of these was Burgondenis, which was his real name reversed with a little variation. The principal of these works are, 1. "Notitia Imperii, five Discursus ad Instrumenta Pacis Osnaburgomonastricnsis:" this contains an useful list of the German

historians and writers on public law: 2. "Thesaurus Rerum publicarum totius Orbis," in four volumes 8vo., a work which, though imperfect, is useful, particularly for the knowledge of modern kingdoms. And 3. "Tractatus de Rebus publicis turbidis in tranquillum statum reducendis." The author died at Geneva in the year 1678.

OLDENDORF, in *Geography*, a town of Westphalia, in the principality of Calenberg; 20 miles N.N.W. of Gottingen. N. lat. $51^{\circ} 47'$. E. long. $9^{\circ} 41'$.—Also, a town of Westphalia, in the county of Schauenburg, on the Wefer. N. lat. $52^{\circ} 8'$. E. long. $9^{\circ} 20'$.

OLDENLANDIA, in *Botany*, a name of Plumier's, in his *Nova Genera* 42. t. 36, was designed to commemorate Henry Bernard Oldenland, there called a German, but who it seems was really a Dane. Having imbibed a taste for botany, under the tuition of Herman at Leyden, he undertook a voyage to the Cape of Good Hope, about the year 1695, for the purpose of collecting plants, where he soon after died, at an early age. His herbarium came at length into the hands of the Burmann family, and was taken to Upsal by the last professor of that name, for the inspection of Linnaeus, who described from thence many of his *Plantæ Africanæ Rariores*, in the *Amœn. Acad.* v. 6.

The original *Oldenlandia* however proving the same genus with *Hedyotis*, and the latter name having obtained precedence, we shall establish a new one, upon three species very erroneously referred to the former, their generic character being essentially different from *HEDYOTIS*; see that article, where we have already adverted to this subject.—Class and order, *Pentandria Digynia*. Nat. Ord. *Succulentæ*, Linn. *Saxifraga*, Juss.

Gen. Ch. *Cal.* Perianth superior, of five equal leaves, permanent. *Cor.* Petals five, alternate with, and shorter than, the leaves of the calyx, concave, obtuse. *Stam.* Filaments five, very short, erect; anthers roundish. *Pist.* Germen inferior, large, globose; styles two, rarely but one, spreading, the length of the stamens; stigmas obtuse. *Peric.* Capsule globose, coated, of two confluent cells, opening at the top. *Seeds* numerous, minute, inserted on two flat orbicular vertical receptacles.

Ess. Ch. Calyx of five leaves. Petals five. Capsule inferior, of two cells, with many seeds.

Obf. The parts of fructification are so minute, that our imperfect dried specimens do not allow us to speak with precision respecting the characters of this genus. It seems allied to *Vahlia*, but we rather wish to submit our remarks to those who may be able to examine the plants alive.

1. *O. dichotoma*. (*O. pentandra*; Retz. Obf. fasc. 4. 22. Willd. Sp. Pl. v. 676. *Heuchera dichotoma*; Murray in Comm. Goett. for 1772. 64. t. 1.)—Stalks two-flowered.—Native of the East Indies. Root annual? rather woody. Stems spreading, much branched, leafy, round, downy, a foot long. Leaves opposite, sessile, linear, entire, roughish. Flower-stalks axillary, solitary, cloven, two-flowered. Flowers small, yellowish. Capsule scarcely so large as a hemp-seed. Style, according to Retzius, solitary.

2. *O. sessiliflora*. (*O. digyna*; Retz. Obf. fasc. 4. 23. Willd. Sp. Pl. v. 1. 674.)—Flowers axillary, sessile.—Found at Tranquebar, in rice-grounds, during the rainy season. Stems procumbent, branched. Leaves sessile, lanceolate, entire. Flowers nearly or quite sessile; whether solitary or otherwise is not said, and we have seen no authentic specimen. Petals minute, white. Styles two.

3. *O. depressa*. Willd. Sp. Pl. v. 1. 675; excluding the citation of Rheede.—Leaves elliptical, stalked. Stalks

axillary, in pairs, single-flowered.—Native of the East Indies. Stems prostrate, branched, smooth. Leaves like those of *Thymus Serpyllum*, elliptical, obtuse, smooth, without ribs or veins, unequal, and somewhat heart-shaped at the base. Calyx smooth.

OLDENZEEL, in *Geography*, a town of Holland, in the department of Overissel, the capital of the country of Twente; 40 miles N.W. of Munster. N. lat. $52^{\circ} 24'$. E. long. $6^{\circ} 45'$.

OLDESLOHE, a town of the duchy of Holstein, which has salt-works; 15 miles W. of Lubeck. N. lat. $53^{\circ} 50'$. E. long. $10^{\circ} 27'$.

OLDHAM, JOHN, in *Biography*, an English poet of the seventeenth century, was born at Shipton, in Gloucestershire, in 1653, of which parish his father was minister. He was educated in grammar learning at Tetbury-school, and in 1670 was entered at St. Edmund's hall, Oxford. After an abode of four years at the university he became usher of the free-school at Croydon, where he remained three years. The Popish plot (see the article *OATES*) induced him to write his four satires against the Jesuits. He had previously to this made himself known as a poet, by the composition of some pieces that were handed about in manuscript. One or more of these had fallen into the way of the earls of Rochester and Dorset, and Sir Charles Sedley, who were so much pleased, that they paid the author a visit while in the humble situation at Croydon. Soon after this he removed to the seat of Sir Edward Thurland, as tutor to his grandsons. He afterwards undertook the tuition of a son of Sir William Hicks, and when he had fitted his pupil for foreign travel, he went to London to cultivate his connections among the poets and men of wit in that city. He was soon introduced to Dryden, and obtained the patronage of William, earl of Kingston, who took him to his seat of Holme-Pierrepont, where, in December 1683, he died of the small-pox at the age of thirty. The noble earl erected a monument to his memory in the church of that place. His fame as a poet was chiefly obtained by his satires, the spirited and indignant vein of which gave him the appellation of the English Juvenal. They are, however, coarse in their language, and harsh in their versification, but possess much vigour of style and vivacity of description. Of the poems of Oldham, part were published by himself, and the rest after his death, under the title of "Remains." An edition of the whole, with the author's life, was given in two volumes. Biog. Brit.

OLDHAM, in *Geography*, a market-town and parish in the hundred of Salford, and county palatine of Lancaster, England, is situated on a branch of the river Medlock, at the distance of six miles from Manchester. The ground, upon which the greater portion of the town is built, rises considerably above the surrounding level, and has consequently the advantage of commanding an extensive prospect. The chief trade here is in the manufacture of hats and of strong fustians. Some cotton mills, however, have been established; and as coals are abundant, the machinery is usually put in motion by steam. The market of Oldham is only of recent constitution, as the town is entirely indebted for its present extent and importance to its proximity to, and connection with, Manchester, which may be regarded as the radiating focus of the cotton trade of this country. Oldham is a parochial chapelry, subordinate to Prestwich, but has a church and a chapel belonging to the establishment, besides several dissenting meeting-houses. According to the population returns of 1811, this town contains 2843 houses, and 16,930 inhabitants, being an increase of 4906 persons since the population report of 1801 was taken. Aikin's Description of the Country from thirty to forty Miles round Manchester,

chester, 1 vol. 4to. London, 1795. Beauties of England and Wales, vol. ix. by John Britton, F.S.A.

OLDHEAD, or **OLD HEAD** of *Kinsale*, a cape of Ireland, in the county of Cork, extending to the south and west of Kinsale harbour. It was called by the Spaniards "Cabo de Velbo," and is very high and steep. N. lat. $51^{\circ} 37'$. W. long. $8^{\circ} 30'$.

OLDISLEBEN, a town of the principality of Weimar, seated on a hill near the Unstrutt; 22 miles N. of Weimar.

OLDMIXON, JOHN, in *Biography*, descended from an ancient family in Somersetshire, and flourished in the 17th and 18th centuries; he was a violent opponent of the Stuart family, and in the reign of queen Anne attacked the writers of that period with so much violence, that Pope gave him a conspicuous place in the *Dunciad*. His writings, at a subsequent period, obtained him a situation under government. He died in 1742. Besides his fugitive and temporary pieces, he wrote "A History of the Stuarts," in folio; "A Critical History of England," in two vols. 8vo.; a volume of poems, and some dramatic pieces.

OLDNEY, in *Geography*, a small island near the W. coast of Scotland. N. lat. $58^{\circ} 12'$. W. long. $5^{\circ} 2'$.

OLDYS, WILLIAM, in *Biography*, an historical writer, was the natural son of Dr. Oldys, chancellor of Lincoln, and advocate of the court of admiralty. Having lived a dissolute life, and expended what property had been left him, he became keeper of lord Oxford's library, of which he formed the catalogue when that collection was sold by Osborne the bookseller. He was also employed to superintend the publication of the Harleian miscellany. The only public post he ever had was that of Norroy, king at arms. He died in 1761, at the age of 74. His principal works are the life of sir Walter Ralieggh; some articles in the General Historical Dictionary; those in the *Biographia Britannica* signed G: the British Librarian: Introduction to Haywood's British Muse, and the Life of Richard Carew, the antiquary.

OLEA, in *Botany*, the celebrated *ελαια* of the Greeks, whose value, on account of its oil, has rendered it famous throughout all antiquity. The word is derived from *ελαιος*, smooth, and alludes probably to the nature and qualities of the oil, for there is no remarkable smoothness about the plant, except indeed the upper surface of its leaves. Linn. Gen. 10. Schreb. 13. add. 816. Willd. Sp. Pl. v. 1. 44. Mart. Mill. Dict. v. 3. Ait. Hort. Kew. ed. 2. v. 1. 21. Brown. Prodr. v. 1. 523. Michaux Boreal-Amer. v. 2. 222. Tournef. t. 370. Juss. 105. Lamarck Dict. v. 4. 537. Illustr. t. 8. Gærtn. t. 93.—Class and order, *Dianthia Monogynia*. Nat. Ord. *Sepiaria*, Linn. *Jasminææ*, Juss. *Oleinz*, Brown.

Gen. Ch. Cal. Perianth inferior, of one leaf, tubular, small, deciduous, its mouth four-toothed, erect. Cor. of one petal, funnel-shaped; tube cylindrical, the length of the calyx; limb flat, cloven into four, nearly ovate segments. Stam. Filaments two, opposite, awl-shaped, short; anthers erect. Pist. Germen superior, roundish; style simple, very short; stigma cloven, thickish, with emarginate segments. Peric. Drupa nearly ovate, smooth, of one cell. Seed. Nut ovato-oblong, rugose, generally two-celled.

Obs. Some species are now removed from this genus, see *NOTELÆA*, while *Phillyrea* is by several botanists united to it. See *PHILLYREA*.

Eff. Ch. Calyx cloven at the mouth into four, nearly ovate segments. Drupa superior, single-seeded.

1. *O. europæa*. Common European Olive. Linn. Sp. Pl. 11. Fl. Græc. t. 3. Woodv. Med. Bot. t. 136.—

Leaves lanceolate, entire, pale beneath. Clusters axillary, dense.—Native of the south of Europe, and cultivated universally. It flowers from June to August. Rather a small, evergreen tree, with square, spreading, greyish branches. Leaves opposite, slightly stalked, acute, a little revolute, dark green above. Clusters axillary, opposite, half as long as the leaves, hoary, on opposite, short stalks. Corolla white. Drupa elliptical, violet-coloured, bitter.

Five varieties of this species are enumerated in the *Hortus Kewensis*, differing chiefly in the shape and direction of their leaves, and, in some measure, in the value of their fruit. This is unquestionably the original species of *Olea*, which has been held in all ages as the bounteous gift of Minerva to mankind. It has always been considered as emblematical of peace and plenty; indeed, it has been remarked, that the great quantity of oil which it produces in some countries, effectually realises the latter of these blessings. It is conjectured that the olive came originally from Asia, being cultivated in most parts of Palestine, and having actually given a name to the celebrated mount near Jerusalem.

2. *O. capensis*. Cape Olive. Linn. Sp. Pl. 11. (Ligustrum capense sempervirens, folio crasso subrotundo; Dill. Elth. 193. t. 160.)—Leaves ovate, entire. Clusters panicled, divaricated.—Native of the Cape of Good Hope, flowering from June to September. A small tree, or rather shrub, not much branched, with an erect, blackish-brown trunk beset with ash-coloured dots and lines. Leaves in pairs, decussated, sometimes sinuated at the end, paler underneath, with oblique, smooth veins. Flowers in axillary, panicled sometimes pendent clusters, small and white. There is a variety of this species figured in Jacquin's Hort. Schoenb. v. 1. t. 2, under the name of *undulata*.

3. *O. americana*. American Olive. Linn. Mant. 24. Willd. n. 3. (Ligustrum lauri folio, fructu violaceo, bacis purpureis; Catesb. Carol. v. 1. t. 61.)—Leaves elliptic-lanceolate.—Native of Carolina and Florida. It flowers in June. This species is remarkable for having male and female flowers as well as perfect ones on the same plant. It is an evergreen shrub, with opposite, entire, shining, stalked leaves. Flowers in short, axillary, brachiated clusters, with opposite stalks. Nut obovate, somewhat striated, perforated at the base.

4. *O. excelsa*. Laurel-leaved Olive. Willd. n. 6. Vahl. Symb. v. 3. 3.—Leaves elliptical, acute. Bractæas perfoliate, the lower cup-shaped, permanent; upper large, deciduous.—Native of Madeira, flowering in May. This is a branched tree with an ash-coloured, dotted bark. Leaves opposite and alternate, attenuated at each end, entire, smooth, coriaceous, veinless. Flowers in axillary, opposite, mostly solitary, clusters. Corolla twice as large as in the common olive.

5. *O. cernua*. Drooping Olive. Vahl. Symb. v. 3. 3. Willd. n. 4; excluding the synonym of Lamarck.—Leaves elliptic-lanceolate, very blunt. Clusters axillary, simple. Flowers drooping. Tube of the corolla cylindrical.—Gathered in Madagascar by Commerçon, one of whose specimens is before us. The bark of the young branches is of a glaucous grey. Leaves smaller and blunter than in the last. Flowers drooping; their tube about one-third of an inch long, cylindrical; limb in four spreading triangular segments, not half that length; the orifice bearded. Stamens four, which circumstance, added to our ignorance of the fruit, renders the genus of this species at best very doubtful. Lamarck's t. 8. f. 2, quoted with hesitation in Willdenow, and perhaps in Vahl, whose third volume we have not at hand, is unquestionably a very different thing.

6. *O. fragrans*. Sweet-scented Olive. Thunb. Jap. 18.

t. 2. Willd. n. 7. Ait. n. 5. (Mokksei; Kämpf. Amoen. 844.)—Leaves elliptic-lanceolate, serrated. Flower-stalks simple, single-flowered, axillary, many together.—Native of Cochinchina, China, and Japan, introduced into England in 1771. It is kept in the green-house or stove, flowering in summer, and is valuable for the peculiar and delicious scent of the little white flowers, which is like that of the highest-perfumed green tea. Hence such tea has been reported to be scented with these flowers; but, as far as we can learn, without foundation. The Chinese however are said by Kämpfer to esteem them very much. The leaves of this plant are evergreen, shining, rather dark, finely and sharply serrated. Flowers not bigger than some of the common kinds of *Galium*, pure white at first, but turning to a tawny-brown in decay. Thunberg speaks of the *O. fragrans* as a very large tree in Japan. We have seen it ten or twelve feet high only, as yet, in England. If brought, while in flower, into an apartment, it will continue for some time to perfume the whole house, if regularly watered, and screened from chilling blasts of air.

OLEA, in Gardening, contains plants of the exotic tree kind, as the olive-tree. The species cultivated are the common European olive (*O. europæa*); the Cape olive (*O. capensis*); the American olive (*O. americana*); and the sweet-scented olive (*O. fragrans*.)

Of the first sort there are several varieties; as the warted-olive, which is a native of the Cape. The long-leaved, which is chiefly cultivated in the south of France, and from which they make the best oil. The young fruit is most esteemed when pickled.

And there are several sub-varieties, as the broad-leaved, which is chiefly cultivated in Spain, where the trees grow to a much larger size than the preceding: the leaves are much larger, and not so white on their under-side; the fruit is near twice the size of the Provence olive, but of a strong rank flavour, and the oil is likewise strong.

There are also other varieties; as the narrow-leaved, short hard-leaved, shining-leaved, African, Lucca, &c.

It may be observed, that the olive seldom becomes a large tree; but two or three stems frequently rise from the same root, from twenty to thirty feet high, putting out branches almost their whole length, covered with a grey bark; the leaves are stiff, about two inches and a half long, and half an inch broad in the middle, gradually diminishing to both ends, of a lively green on their upper side and hoary on their under, standing opposite; the flowers are produced in small axillary bunches; they are small, white, and have short tubes spreading open at top; the first is a superior-berried drupe, of an oblong spheroidal form, and of a yellowish-green colour, twining black when ripe.

Preparing the Oil.—The usual method of making oil from olives in Italy is, to crush the fruit to a paste with a perpendicular mill-stone running round a trough; which is then put into flat round baskets, made of rushes, piled one upon another under the press; after the first pressure, scalding water is poured into each basket, its contents stirred up, and the operation repeated till no more oil can be skimmed off the surface of the tubs beneath; but this is not a good method; the oil is seldom pure, keeps ill, and soon grows rancid; but by another process, which is that of pounding the fruit in a mortar, the crushed substance being then thrown into a long woollen bag, and rubbed hard upon a sloping board, and then wrung, adding afterwards hot water, and continuing to press as long as a drop of oil can be drawn, the work is much more effectually performed. See OIL.

The difference in the kind of olive produces a difference in the oil; but concurring circumstances occasion other dif-

ferences. If the olive be not sufficiently ripe, the oil is better; if it be too ripe, the oil is thick and glutinous. The method of extracting the oil has also a very great influence on its quality. The oil-mills are not kept sufficiently clean; the mill-stones, and all the utensils, are impregnated with a rancid oil, which must inevitably communicate its flavour to the new oil. In some countries it is usual to lay the olives in heaps, and suffer them to ferment before the oil is drawn. By this management the oil is bad; and this process can only be used for oil that is intended for the lamp, or for the soap-boiler.

The unripe olives, when pickled, especially the Provence and Lucca sorts, are to many extremely grateful, and supposed to excite appetite and promote digestion. According to Miller, they are prepared by repeatedly steeping them in water; to which some add alkaline salt or quick lime, in order to shorten the process; after which they are washed, and preserved in a pickle of common salt and water, with sometimes the addition of an aromatic.

In some places, says Chaptal, they are macerated in boiling water, charged with salt and aromatics; and, after 24 hours digestion, they are steeped in clear water, which is renewed till their taste is perfectly mild. Sometimes nothing more is done than to macerate the olives in cold water; but they are frequently macerated in a lixivium of quick-lime and wood-ashes, after which they are washed in clear water. But in whatever manner the preparation is made, they are preserved in a pickle charged with some aromatic plant, such as coriander and fennel. Some persons preserve them whole, others split them, for the more complete extraction of their mucilage, and in order that they may be more perfectly impregnated with the aromatics. All these processes evidently tend to extract the mucilaginous principle, which is soluble in water, and by these means to preserve the fruit from fermentation. When the operation is not well performed, the olives ferment and change. If olives be treated with boiling water, to extract the mucilage, before they are submitted to the press, a fine oil will be obtained, without danger of rancidity. When the oil is made, if it be strongly agitated in water, the mucilaginous principle is disengaged; and the oil may be afterwards preserved for a long time without change. Chaptal says, that he has preserved the oil of the marc of olives, prepared in this manner, for several years, in open bottles, without any alteration. Chaptal's El. of Chem. vol. iii.

It is said, that when the olives are put into those small barrels, in which they are brought to us, they give them a flavour by throwing over them an essence usually composed of cloves, cinnamon, coriander, and fennel. But this essence is a kind of secret with those who deal in them; and it is in this that the whole difficulty of the preparation is said to consist.

The best salad oil is of a bright pale amber colour, bland to the taste, and without the least smell.

It has been observed, that with a little protection in severe frost, the olive-tree may be maintained against a wall about London, but that in Devonshire there are some of these trees which have grown in the open air many years, and are seldom injured by frost, yet the summers are not warm enough to bring the fruit to any great perfection.

Method of Culture.—In Languedoc and Provence, where the olive-tree is greatly cultivated, they propagate it by truncheons, split from the roots of the trees; for as these trees are frequently hurt by hard frosts in winter, so when the tops are killed, they send up several stalks from the root; and when these are grown pretty strong, they separate them with an axe from the root; in the doing of which they are

are careful to preserve a few roots to the truncheons; these are cut off in the spring after the danger of the frost is over, and planted about two feet deep in the ground, covering the surface with litter or mulch, to prevent the sun and wind from penetrating and drying the ground; when the plants have taken new root, they are careful to stir the ground, and destroy the weeds.

These trees will grow in almost any soil, but when they are planted in rich moist ground, they grow larger and make a finer appearance than in poor land; but the fruit is of less esteem, because the oil made from it is not so good as that which is produced in a leaner soil. The chalky ground is esteemed the best for these trees, and the oil which is made from the trees growing in that sort of land is much finer, and will keep longer than the other.

In the countries where the inhabitants are curious in the making of their oil, they are frequently obliged to get truncheons of the ordinary sorts of olives to plant; but after they have taken good root, they graft them with that sort of olive which they prefer to the others. In Languedoc, they chiefly propagate the corneau, the ampoulan, and moureau, which are three varieties of the first species, or Provence olive with a smaller oblong fruit; but in Spain the second sort, or Spanish olive with the largest fruit, is generally cultivated, where they have more regard to the size of the fruit, and the quantity of oil they will produce, than to their quality.

These plants may be propagated in this climate by layers, which should be made from the young branches in the spring, in the usual manner, and be occasionally watered during the summer season, when in the autumn following they may be taken off and be planted in separate pots, being duly watered and placed in proper shade till fresh rooted, removing them in the beginning of the autumn into the shelter of the green-house. The layers sometimes, however, require two summers before they become perfectly rooted. But it is, notwithstanding, the best method to purchase plants of this sort, which are annually sent to the Italian warehousemen in London, of pretty large sizes, with orange and other trees, as they are very tedious in raising from layers.

These plants, after being thus procured, and cleaned from filth by soaking their roots in water, should be planted in pots filled with fresh sandy light earth, plunging them in a moderate hot-bed, shading them in the hot sun, and refreshing them occasionally with slight waterings as the earth in the pots becomes dry. When they begin to shoot they should have air admitted pretty freely in proportion to the weather, being afterwards inured to the open air in a place defended from winds, removing them in the beginning of autumn into the green-house. And after they have in this management acquired strong roots, they may be removed with earth about them, and be planted out in the open ground in a dry warm situation, being managed as myrtles and other similar plants. When covered by mats in the winter frost, great care must be taken to prevent their becoming mouldy, by not letting them remain covered too long, without the air being admitted.

They flower and produce fruit sometimes in two or three years.

These plants all afford variety among others of the green-house kind, as well as in other situations.

OLEA is also the name of a stone described by Ludovicus Dulcis, and some other such authors, who attribute great virtues to it, and say it was variegated with several colours, as yellow, black, white, green, &c. It seems to have been some one of the common agates, to which their ignorance had prompted them to give a new name.

OLEAGINOUS, something that partakes of the nature of oil; or out of which oil may be expressed.

Thus olives, nuts, almonds, &c. are oleaginous fruits, or fruits out of which oil is expressed.

Pines, firs, &c. are oleaginous woods, yielding resin, turpentine, &c. Of all woods, oleaginous ones burn the best.

OLEANDER, or ROSE-BAY, in *Botany*. See NERIUM.

OLEARIUM, in *Natural History*, a species of *Buccinum*.—Also, a species of *Murex*; which see.

OLEARIUS, a species of *Turbo*; which see.

OLEARIUS, ADAM, in *Biography*, a learned German, was born in 1603, at Aßlerleben, in Lower Saxony. He was for some time a professor at Leipzig, which office he quitted for a place in the service of Frederic, duke of Holstein-Gottorp. The prince had a plan of bringing a share of the commerce of the Levant to his new town of Frederickstadt, and for that purpose sent an embassy to the czar of Muscovy, and the king of Persia, which embassy Olearius joined in the quality of secretary and counsellor. The mission continued six years, viz. from 1633 to 1639; and Olearius drew up an account of the journey in the German language, printed at Sleswick in 1656 and 1671, accompanied with figures designed by himself. It is a curious and highly esteemed work, and has been translated into several languages. Upon his return, Olearius took up his residence at Gottorp, and was appointed librarian, antiquary, and mathematician to the duke. He died in 1671. He was very learned in mathematics; a skilful musician; and a proficient in the oriental languages, especially in the Persian. He was author of many other works, as "The Valley of Persian Roses, a Collection of pleasant Stories, ingenious Sayings, and useful Maxims, by the Poet Shach-Saadi, translated into German;" "A Narrative of a Voyage to the Indies, by Albert de Mandeflo, with Remarks;" "An abridged Chronicle of Holstein, from 1448 to 1663;" "The Gottorp Cabinet of Curiosities." Moreri.

OLEARIUS, GODFREY, a learned German Lutheran divine in the seventeenth century, was born at Halle, in Saxony, in the year 1604. He was educated for the church, and became pastor of St. Ulric's church, in his native city. After this he was created doctor of divinity, appointed pastor of St. Mary's, and was nominated superior and inspector of the Lutheran Gymnasium; and finally made superintendant of the churches in the duchy of Magdeburg by the elector of Brandenburg. He died in 1685, at the age of eighty-one. He was author of several theological works, among which were "A Life of Christ, from the four Evangelists;" and "An Explication of the Book of Job." Moreri.

OLEARIUS, GODFREY, grandson of the last, was born at Leipzig in the year 1672. When he had completed his academical course he went to Holland, and from thence to England, for farther improvement. Upon his return to Leipzig in 1699, he obtained a professorship of the Greek and Latin languages; an office which he filled with distinguished ability till the year 1708, when he was appointed to the theological chair. He obtained other considerable offices, and died in 1715, leaving behind him many works that testify to his industry and talents; among these were "An Introduction to the Roman and German Histories;" a Latin version of "The History of the Apostles' Creed," from the English of sir Peter King; a Latin version of "Stanley's History of Philosophy," and several theological works of considerable merit. The father of this person, viz. John Olearius, was born at Halle in 1639, was also distinguished for his literary acquirements, and was one of the first who engaged with Carpzovius, Alberti, and Litigius

gius in furnishing contributions to the "Leipfic Acts." He was created doctor of divinity, and was ten times raised to the dignity of rector. He died in 1713. Moreri.

O'LEARY, ARTHUR, an eminent Catholic priest of the last century, was born in the city of Cork. He was sent to France at an early age, and pursued his studies at the college of St. Malo's in Brittany, after which he entered into the Franciscan order of Capuchins. When he had finished his studies, he was appointed chaplain to a regiment of his countrymen in the service of the French king, an office which he soon gave up, and returned to his native country. By the assistance of some friends he built a small chapel in his native city, in which he officiated. While employed in the duties of his profession, he combated a work at that time published in Cork, entitled "Thoughts on Nature and Religion," and with the leave of the bishop of his diocese, he published a piece in justification of his own creed, in opposition to the dogmas of his antagonist, entitled "A Defence of the Divinity of Christ, and the Immortality of the Soul." Shortly after this, when the parliament of Ireland shewed a disposition to relax the rigour of the penal laws against the Roman Catholics, and framed a sort of test oath, to be administered to such of them as should claim the benefit of acts passed in their favour in the year 1782, many persons hesitated about the propriety of taking it. On this occasion Mr. O'Leary published a tract entitled "Loyalty asserted, or the Test-oath vindicated," in which he explained the seeming difficulties that occurred so much to the satisfaction of his Catholic countrymen, that they almost unanimously complied with the provision of the legislature. These publications were highly applauded, and obtained for the author many friends among the liberal and enlightened, but at the same time they excited against him the envy and jealousy of priests, who possessed neither the spirit nor the talent to act in the same manner. He enjoyed his triumph, and having shewn that the Roman Catholics of Ireland might, consistently with their religion, swear that the pope possessed no temporal authority or jurisdiction in that kingdom, he became the favourite and friend of almost all the eminent Irish political and literary characters. At this critical period, when the combined fleets of France and Spain insulted the British coast, and threatened an invasion of Ireland, he addressed his Catholic countrymen in the most energetic language, in the cause of order and loyalty, and with such effect as to merit the thanks of the government. He was equally successful, not only in quelling those insurgents who had attacked the tythe-proctors of the Protestant clergy, but in bringing them to a sense of their misconduct. This occasioned an attack upon himself from Dr. Woodward, the Protestant bishop of Cloyne, which he repelled in "A Defence of the Conduct and Writings of the Rev. Arthur O'Leary, &c. written by himself, in Answer to the ill-grounded Insinuations of the Right Rev. Dr. Woodward." This defence, published in 1788, is a master-piece of wit, argument, irony, and energetic writing, and yet was drawn up in less than eight hours. His antagonist on this occasion acknowledged, that O'Leary represents matters "strongly and eloquently," and that, "Shakspeare-like, he is well acquainted with the human heart." Soon after this he left Ireland, and came to London, where he resided for many years as principal minister of the Roman Catholic chapel in Soho-square: here he was highly esteemed, and extremely well attended by persons of his own persuasion. In this place he pronounced, in the year 1800, a funeral oration on pope Pius VI., before a vast concourse of English nobility, and foreigners of high rank. He died at an advanced age in the month of January 1802, and was attended

to his grave at St. Pancras church by many thousands of the Catholics, by whom he was highly respected, as well for his ardent piety as for his impressive manner as a preacher. As a writer, his style is fluent, bold, and figurative; but deficient in grace, perspicuity, and sometimes grammar. His highest praise, however, arises from his having been a distinguished friend to freedom, on which account he was frequently complimented by Messrs. Grattan, Flood, and other distinguished members of the Irish parliament, in their public speeches. He was author of many works besides those already referred to. His "Miscellaneous Tracts" form one volume 8vo. For farther particulars, the reader may consult the Monthly Magazine for March 1802.

OLEASTER, JEROME, a learned Portuguese monk, who flourished in the sixteenth century, was probably a native of Azambuja, a town on the banks of the Tagus. In the year 1520, he took the habit of the Dominican order in a monastery at Lisbon, and soon acquired the character of an excellent philosopher, a sound divine, and a perfect master of the Latin, Greek, and Hebrew languages. Above all, he had the reputation of being most intimately conversant with the sacred scriptures. In 1545 he was one of the divines whom John III. king of Portugal, sent to assist on his behalf at the council of Trent. Upon his return, he was nominated bishop of St. Thomas' in Africa, but he declined accepting that dignity. He was afterwards appointed to the office of "Inquisitor," and filled the various offices of trust and honour in that province of his order. He died in the year 1563. He was author of "Commentaries" on many parts of the scriptures, but the work by which he is chiefly known is entitled "Hieronymi ab Oleastro Commentarii in Pentateuchum," which was published in the years 1556—8, in five parts, forming together a folio volume. This edition is very rare, and much sought after by collectors, owing to the circumstance of its not having been subjected to the examination of the inquisitorial office. It has passed through several other editions. His Commentary on Isaiah was first published at Paris in 1623. Moreri and Gen. Biog.

OLEASTER, in the *Materia Medica*, the name of the fallow thorn, or sea buckthorn, the *rhamnoides falicis folio* of botanical authors.

OLEASTRUM, in *Ancient Geography*, a town of Spain, on the route from Tarragona to Tortosa; situated on the sea-coast, in the country of the Coretani, S.W. of Tarraco.

OLECRANON, in *Anatomy*, a process of the ulna, which forms the prominence of the elbow. See EXTREMITIES.

OLECRANON, *Fractures of*. See FRACTURES.

OLEFIANT GAS. This is an inflammable gas, composed of carbon and hydrogen. It burns with a brilliant flame. This gas is formed during the burning of wax and spermaceti oil, which accounts for the brilliant light afforded by those combustible bodies. When we recollect the great density of this gas, we are not surprised at its brilliant flame. Although only one-sixth of it is hydrogen, yet that is as condensed as to give a light, the density of which is to that of hydrogen as 12.5.

Mr. Dalton has determined the weight of the atom of this gas to be 6.4, being an atom of carbon 5.4 with an atom of hydrogen 1. See *Olefiant Gas* under CARBON, and GAS.

OLEGOU, in *Geography*, a cape of Russia, in the sea of Ochotsk; 252 miles E. of Ochotsk. N. lat. 59° 20'. E. long. 151° 14'.

OLEINÆ, in *Botany*, a natural order of plants, separated by Mr. R. Brown, after Hoffmannsegg and Link, from the

the *Jasmineæ* of Jussieu, and including *Chionanthus*, *Olea*, *Phillyrea* (by some united to *Olea*) and *Notelæa*. We do not see the grounds of the above separation. See JASMINEÆ and NOTELÆA.

OLEKMA, in *Geography*, a river of Russia, which rises in the mountains on the frontiers of China, in N. lat. 49° , and flowing due north, enters the Lena, opposite to Olekminsk.

OLEKMINSK, a town of Russia, on the Lena, at its junction with the Olekma, in the government of Irkutsk. N. lat. $60^{\circ} 25'$. E. long. $119^{\circ} 14'$.

OLEN, in *Biography*. See OLENUS.

OLENEI, in *Geography*, a cape of Russia, at the W. side of the mouth of the Obkskaia gulf, in the Karskoi sea. N. lat. $72^{\circ} 15'$. E. long. $72^{\circ} 22'$.

OLENEI Nos, a cape of Russia, in the White sea; 60 miles N. of Archangel.

OLENEK, a town of Russia, at the mouth of the river Olenek, near the Frozen ocean. N. lat. $72^{\circ} 24'$. E. long. $114^{\circ} 14'$.—Also, a river of Russia, which rises in N. lat. $67^{\circ} 20'$, and runs into the Icy sea, N. lat. $72^{\circ} 30'$. E. long. $104^{\circ} 14'$.

OLENI, a town of Poland, in the palatinate of Braclaw; 52 miles N.W. of Braclaw.

OLENKA, a river of Russia, which runs into the Tunguska, N. lat. $58^{\circ} 6'$. E. long. $95^{\circ} 14'$.—Also, a river of Russia, which runs into the Vitim, N. lat. $55^{\circ} 30'$. E. long. $115^{\circ} 54'$.

OLENOS, in *Ancient Geography*, a town of Achaia, towards the N.W. near the mouth of the river Melas; supposed to be the present "Caminitza."

OLENSKOI, in *Geography*, a town of Russia, in the government of Archangel, on the Vokscha; 120 miles E. of Archangel.

OLENUM, in *Ancient Geography*, a town of Peloponnesus, in Achaia, between Patræ and Dyme.

OLENUS, in *Biography*, a Greek poet, older than Orpheus, came from Xauthe, a city of Lycia. He composed several hymns, which were sung in the temple of Delos upon festival days. Olenus has the reputation of being one of the founders of the oracle at Delphi, and he is said to have been the first who filled, at that place, the office of priest of Apollo, and to have given responses in verse.

OLEOSUM *Sal Volatile*. See SAL.

OLEOUT, in *Geography*, a river of America, in New York, which runs into the E. branch of the Susquehannah.

OLERON, a town of France, in the department of the Lower Pyrenees, and chief place of a district; 10 miles W. of Tarbe. The place contains 5158, and the canton 13,977 inhabitants, on a territory of 140 kilometres, in 19 communes. N. lat. $42^{\circ} 10'$. W. long. $0^{\circ} 32'$.—Also, a town of France, in the department of the Lower Charente, on the E. coast of the island of Oleron; 15 miles S. of La Rochelle. N. lat. $45^{\circ} 33'$. W. long. $1^{\circ} 6'$.—Also, an island in the Atlantic, near the W. coast of France, $5\frac{1}{2}$ leagues long and from one to two wide; separated from the continent by a narrow channel, called "Pertuis de Maubuffon," and from the island of Ré by the "Pertuis de Antioche." The inhabitants, estimated at 12,000, are distributed in the town of Oleron and several villages. The soil is fertile; but most of the occupiers are seamen. It was formerly in the possession of the crown of England, and has been famous for the laws mentioned in the next article. N. lat. $45^{\circ} 46'$. W. long. $1^{\circ} 11'$.

OLERON, *Laws of*. The inhabitants of the island of

Oleron have been able mariners for seven or eight hundred years past; so that they framed and drew up the laws of the navy or marine, which are still called the laws of Oleron. According to the French writers these maritime laws were digested in the fore-mentioned island under the title of "Reole des jugemens d'Oleron," by direction of queen Eleanor, the wife of Henry II., in her quality of duchess of Guienne, and afterwards enlarged and improved by her son Richard I. But Selden (*De Dominio Maris*, c. 14.) denies this, and maintains that these laws were compiled and promulgated by Richard I., as king of England. See *USES and customs of the sea*.

These laws, being accounted the most excellent sea-laws in the world, are recorded in the Black Book of the Admiralty.

OLES, in *Geography*, a town of Istria; 16 miles N.W. of Pedena.

OLESA, a town of Spain, in the province of Catalonia; 16 miles N.W. of Barcelona.

OLESKO, a town of Poland, in the palatinate of Belcz; 36 miles S.E. of Belcz.

OLESNICK, a town of Poland, in the palatinate of Sandomirz; 28 miles W. of Sandomirz.

OLETTA, a town of the island of Corfica; 6 miles S.W. of Bastia. N. lat. $42^{\circ} 33'$. E. long. $9^{\circ} 30'$.

OLETTE, a town of France, in the department of the East Pyrenees, and chief place of a canton, in the district of Prades; 7 miles S.W. of Prades; celebrated for its warm baths. The place contains 1000, and the canton 5361 inhabitants, on a territory of 385 kilometres, in 24 communes.

OLEVITO, LA, a town of Naples, in Principato Citra; 23 miles E. of Salerno.

OLEUM, OIL. See OIL.

OLEUM *Medicum*, in the *Writings of the Ancients*, a name given to a famous oil which had a quality of burning under water, in spite of all that could be done to quench it. It was called *Medicum*, because of its being produced among the Medes, and some have called it *oleum Medææ*, because it was supposed to be that substance with which Medææ anointed the crown of her rival. Ammianus Marcellinus tells us, that if an arrow was anointed with this oil, and shot out of a bow against any inflammable substance, the whole immediately took fire, and, if any one attempted to quench the flames by water, they only burnt the more fiercely for it. The *venenum Pharicum* of Nicander is supposed to be the same with this oil.

OLEUM *Medææ*, a name given by the ancients to the mineral fluid, more generally known by that of *naphtha*.

OLEUM *Vitri Antimonii*, in *Medicine*, a name given by Basil Valentine, and others, to a famous preparation of antimony, which they keep as a secret, or at least declare in such terms as are unintelligible, and boast of, as the universal medicine. The learned Kerkring has given the process for making this red oil of the glass of antimony, but that in so enigmatical a manner, that he seems himself not to expect any body to understand him; and only says, in his own justification, that he has given it in plainer terms than any body had done before him. The author relates many wonderful things of this diaphoretic oil, on his own experience; particularly, the curing a confirmed dropsy, by throwing off the water by sweat; so that the patient, in a manner, swam in it, and the drops run through the bed, in all parts, to the floor. It were well if we could understand the process.

OLEWSKO, in *Geography*, a town of Poland, in the palatinate of Brzecz; 88 miles E.S.E. of Pinsk.

OLFACTORIUS NERVUS, in *Anatomy*, the nerve of the first pair, which is distributed in the nose, and in which the sense of smelling resides. See **NERVE**.

OLGSKOI, in *Geography*, a town of Russia, in the government of Oionetz, seated on the Latcha lake; 12 miles S. of Kargopol.

OLHOH, a town of Arabia, in the province of Hedjas; 66 miles S.S.E. of Mecca.

OLIANA, a town of Spain, in the province of Catalonia; 7 miles N.W. of Solsona.

OLIAPOUR, a town of Bengal, capital of the circar of Baharbund; 195 miles N.N.E. of Calcutta. N. lat. $25^{\circ} 22'$. E. long. $89^{\circ} 42'$.—Also, a town of Hindoostan, in Dowlatabad; 20 miles N.W. of Darore.

OLIAROS, in *Ancient Geography*, a small island in the number of the Cyclades, situated near to and W. of Paros, said to be a colony of Sidonians.

OLIAS, in *Geography*, a small, but very agreeable, town of Spain, on the road from Madrid to Toledo, two leagues from the latter place. It is the only place in this route which affords any fruit-bearing trees.

OLIBA, in *Ancient Geography*, a town of Spain, in the Tarragonensis, and in the country of the Bærones.

OLIBANUM, in *Pharmacy*, a kind of gum resin, usually called *male FRANKINCENSE*; which see.

It has its name *olibanum*, *quasi oleum Libani*; because distilled in form of an oil, from the bark of a tree growing on mount Lebanon: the *Juniperus Lycia*. It is collected chiefly in Arabia, and imported in chests and casks from the Levant. Its specific gravity is 1.173. Distilled alone it affords a volatile oil; but in conjunction with water or alcohol no oil comes over. Alcohol dissolves three-fourths of it: after trituration with water and deposition of the resinous matter, three-eighths remain dissolved: ether takes up more than one-half, leaving after evaporation in water a very pure transparent resin; and the undissolved part, becoming white and opaque, is almost entirely soluble in water, forming a milky solution. Hence olibanum appears to consist of resin, gum, and a volatile oil. For its other properties and uses, see **FRANKINCENSE**.

OLIBATO, or **LIBATTA**, in *Geography*, a river of Africa, which runs into the sea, E. of Cape Lopez Gonsalvo, forming a bay at its mouth. This river is said to abound with crocodiles.—Also, a town of Africa, in Lower Guinea, on the above-named river, containing about 300 houses; 36 miles E. of Cape Lopez Gonsalvo. S. lat. 1° . E. long. $10^{\circ} 54'$.

OLICANA, in *Ancient Geography*, a town of the isle of Albion, in the country of the Brigantes, which was situated at Ilkley, on the river Wharfe, in Yorkshire.

OLIFANT'S, **OLIPHANT'S**, or *Elephant River*, a river of Africa, on the western coast of the Cape of Good Hope, which, after collecting the streamlets of the first chain of mountains in its northerly course along their feet, discharges itself into the Southern Atlantic, S. lat. $31^{\circ} 30'$. The navigation of this river is impeded by a reef of rocks across its mouth. Olifant's river, which is a fine clear stream, flowing through a narrow valley, hemmed in between the great chain of mountains and an inferior ridge called the "Cardouw," forms one of the divisions of the district of Stellenbosch and Drakenstein. This valley, being intersected by numerous rills of water from the mountains on each side, is extremely rich and fertile; but the great distance from the Cape, and the bad roads over the Cardouw, present little encouragement for the farmer extending the cultivation of grain, fruit, or wine, beyond the necessary supply of his

own family. Dried fruit is the principal article they send to the market, after the supplies which they furnish, of horses, horned cattle, and sheep. The country on each side of the lower part of the river is dry and barren, and for many miles from the mouth entirely uninhabited. A chalybeate spring of hot water, of the temperature of 108° of Fahrenheit's scale, flows in a considerable stream out of the Cardouw mountain into the Olifant's river; and a bathing-house is erected over the spring. All the smaller kinds of antelopes, jackalls, hares, and partridges are very abundant in this and the adjoining divisions of Stellenbosch and Drakenstein. Barrow's Africa, vol. ii.

OLIGACTIS, in *Natural History*, a name given by Linnæus, and others, to a genus of star-fish, consisting of those which have fewer than five rays.

OLIGAEDRA, the name of a genus of crystals.

The word is derived from the Greek *ολιγος*, a few, and *εδρα*, a plane, or side, and expresses a crystal, which is composed of only a few planes.

The bodies of this class are crystals of the imperfect kind, being composed of columns affixed irregularly to some solid body at one end, and, at the other, terminated by a pyramid; but the column and pyramid being both pentangular, the whole consists only of ten planes, not, as the common kind, of twelve.

OLIGARCHY, formed from *ολιγος*, few, and *αρχη*, government, a form of government, wherein the administration is in the hands of a few persons.

The states of Venice and Genoa may be ranked among oligarchies.

Oligarchy amounts to much the same thing with aristocracy; unless perhaps the former imports a kind of defect or corruption; as if the sovereign power were monopolized by a few persons, in prejudice of the rights of a great number.

OLIGARRHENA, in *Botany*, so named by Mr. Brown, from *ολιγος*, few, and *αρσεν*, a male, because of the stamens being but two, though usually, in the natural order to which the plant belongs, they are five.—Brown Prodr. Nov. Holl. v. 1. 549.—Class and order, *Diandria Monogynia*. Nat. Ord. *Epacrideæ*, Brown.

Eff. Ch. Calyx in four deep segments, with two scales at the base. Corolla four-cleft, its segments not imbricated in the bud, permanent. Stamens within the tube. Germen of two cells. Capsule? of two cells.

1. *O. micrantha*. Gathered by Mr. Brown on the southern coast of New Holland. A small, upright, much branched shrub. Leaves scattered, imbricated, minute. Spikes terminal, erect. Flowers small, white, with four scales, or nectaries, under the germen.

A paradoxical plant, in its artificial characters not much unlike the natural order of *Oleaceæ*, but in habit totally different. Br.

OLIGOTROPHEROS, among the Greeks, a name given to the finer sort of bread made of the finest flour.—They called it by this name because of the little share of nourishment it conveyed; and by way of distinction from it, called the brown bread *polytropheros*, or much nourishing.

OLIKA, in *Geography*, a town of Poland, in Volhynia; 23 miles N.E. of Lucko.

OLIKAN, a small island of Russia, in the Penzinskoi sea. N. lat. $60^{\circ} 16'$. E. long. $155^{\circ} 36'$.

OLIL, a town of Africa, in Calbari, on the Rio del Rey. N. lat. $4^{\circ} 15'$.

OLIMPIA, a town of European Turkey, in the Morea; 32 miles S.S.E. of Chiarenza.

OLIMPO,

OLIMPO, a mountain of European Turkey, in Thessaly; 10 miles N. of Larissa.—Also, a mountain of Asiatic Turkey, in Natolia; 50 miles N.W. of Kintaja.

OLINA, in *Ancient Geography*, a town of Spain, in the Tarragonensis, situated in the interior of the country of the people called Callaici Lucensci. Ptolemy.

OLINDA, in *Geography*. See FERNAMBUCO.

OLIO, or **OGLIO**, a savoury dish, or food, composed of a great variety of ingredients; chiefly found at Spanish tables.

The forms of olios are various. To give a notion of the strange assemblage, we shall here add one from an approved author.

Take rump of beef, neats tongues boiled and dried, and Bologna sausages; boil them together, and, after boiling two hours, add mutton, pork, venison, and bacon, cut in bits; as also turnips, carrots, onions, and cabbage, borage, endive, marigolds, sorrel, and spinach; then spices, as saffron, cloves, mace, nutmeg, &c. This done, in another pot put a turkey or goose, with capons, pheasants, wigeons, and ducks, partridges, teals, and stock-doves, snipes, quails, and larks, and boil them in water and salt. In a third vessel, prepare a sauce of white wine, strong broth, butter, bottoms of artichokes, and chefnuts, with cauliflowers, bread, marrow, yolks of eggs, mace, and saffron: lastly, dish the olio, by first laying out the beef and veal, then the venison, mutton, tongues, and sausages, and the roots over all; then the largest fowls, then the smallest, and lastly pour on the sauce.

OLIPHANTS, in *Geography*, a town of America, in North Carolina; 20 miles W. of Salisbury.

OLISI, a town of Hindooستان, in the Carnatic; 8 miles N.E. of Ongoli.

OLISIPO, in *Ancient Geography*, now Lisbon, a town of Hispania, in Lusitania, near the mouth of the Tagus. This town was a Roman colony, with the epithet of "Felicitas Augusta." See LISBON.

OLISTHEMA, from *ολισθωνω*, to fall out, in *Surgery*, a dislocation, or luxation.

OLITA, in *Geography*, a town of Mexico, in the province of Xalisco.—Also, a town of Lithuania, in the palatinate of Troki; 28 miles S.W. of Troki.—Also, a town of Spain, in Navarre, containing, in its present reduced state, four churches and two convents; 20 miles S. of Pamplona. N. lat. $43^{\circ} 30'$. W. long. $1^{\circ} 42'$.

OLITORY, a kitchen garden, or a garden of herbs, roots, &c. for food. See GARDEN, SALLET, &c.

OLIVA, GIOVANNI, in *Biography*, a learned antiquary, was born at Rovigo, in the Venetian territory. He embraced the ecclesiastical profession, and was ordained priest in 1711. His literary reputation caused him immediately after to be nominated professor of the belles lettres at Azzolo, which post he occupied about eight years. In 1718 he published at Venice a very learned treatise, entitled "De Antiqua in Romanis scholis Grammaticorum disciplina." He was invited to Rome, in 1719, by pope Clement XI., and appeared with distinction among the learned men of that capital. On the discovery of a four-footed Isis among some ruins, he wrote a Latin dissertation upon it, in which he displayed much erudition respecting Egyptian mythology. In 1722 the cardinal Rohan appointed Oliva to be his librarian, in which office he continued during the remainder of his life, occupying himself indefatigably in enriching the vast collection of that prelate, and drawing up an exact account of its contents. The catalogue amounted to twenty-five volumes in folio. He gave an edition, in 1723, of some letters of Poggio, which had hitherto re-

mained in manuscript. He died at Paris in 1757; after his death were printed his works, consisting of the two dissertations already referred to, together with another, pronounced at Azzolo, "On the Necessity of adding the Study of Medals to that of History." Moreri.

OLIVA, in *Geography*, a sea-port town of Pomerania, situated on a bay in the Baltic, and famous for a treaty of peace which was concluded between the emperor and the kings of Sweden and Poland, in the year 1660; 10 miles W. of Dantzic. N. lat. $54^{\circ} 26'$. E. long. $18^{\circ} 22'$.—Also, a town of Spain, in Valencia, near the Mediterranean coast, in the vicinity of which sugar canes are cultivated; 40 miles N. of Alicant.—Also, a small island in the Mediterranean, near the coast of Caramania. N. lat. $36^{\circ} 25'$. E. long. $33^{\circ} 10'$.

OLIVAREZ, Count de, in *Biography*, named Gaspar de Gusman, favourite and minister to Don Philip IV. of Spain, succeeded Uzeda as prime minister, and gained popularity by his wife and salutary regulations. Notwithstanding the good he did, he was always an enemy to peace, and it was owing to his ambition that an almost general war was excited about the year 1627, which proved very fatal to Spain. His pride and obstinacy were the cause of many calamities to his country. The revolt of the Catalans, whom he wished to deprive of their privileges, was a consequence of his folly: he had privately employed the marquis de los Velez to extinguish this rebellion; but the cruelty of the measures used for this purpose only inflamed it the more. The revolution of Portugal, which was terminated by its separation from the Spanish provinces, another disastrous event, was also the result of his temper. The great secret by which Olivarez had governed his master, was being the companion, or at least the confidant, of his pleasures. While he attempted to deceive the world with a specious appearance of religion and piety, he was not only immersed in vice himself, but encouraged and promoted it in the monarch, to the scandal of his subjects, and the prejudice of his affairs. At length his schemes began to be entirely broken and defeated; he fell under the displeasure of the queen, the emperor, the grandees, and the people, at one and the same time, and experienced the disgrace which he had long merited. He was banished to Toro, where, worn out by infirmities, or overcome by despair, he ended his days about the year 1645.

OLIVAREZ, in *Geography*, a town of Spain, in Old Castile; 18 miles S.E. of Valladolid.

OLIVARIA CORPORA, in *Anatomy*, two small eminences of the medulla oblongata. See BRAIN.

OLIVAS, in *Geography*, a town of Portugal, in the province of Beira; 6 miles S.W. of Viseu.

OLIVE, PETER JOHN DE, in *Biography*, a celebrated Franciscan monk in the thirteenth century, was regarded as chief of that branch of the order which disputed so frequently with the popes, in favour of the renunciation of property in obedience to the institution of St. Francis. He acquired, by his writings, a high reputation for sanctity and sound learning, and drew after him a number of followers. One of the great objects which he seems never to have lost sight of in his writings, was the corruption of the church of Rome, which he censured with great severity, in a work entitled "Postilla, or a Commentary on the Revelation," affirming boldly that the church was represented by the woman, upon whose forehead was a name written, "Mystery, Babylon the great, the mother of harlots, and abominations of the earth," whom St. John saw sitting "upon a scarlet-coloured beast, full of names of blasphemy, having seven heads and ten horns." It must be observed, that this censor

of the church was himself a most superstitious fanatic in several respects, having imbibed the greatest part of those opinions which the spiritual Franciscans pretended to have received from the abbot JOACHIM; see his article. He went still farther, and contended that St. Francis, whom he considered as wholly and entirely transformed into the person of Christ, was the subject of adoration. He was himself accused of heresy, and censured by his judges, but submitting to the judgment patiently, he escaped the severe treatment to which many of his followers were subjected. He died in 1297, and it was pretended, that miracles were wrought at his tomb. The zeal with which he defended the cause of the gloomy Franciscans, in his "Treatise on Poverty," and his other writings, led them to venerate him as a saint. But in the year 1325, pope John XXII. ordered his bones to be taken from the tomb, and publicly burnt, together with his writings; pope Sixtus IV., however, ordered his works to be examined anew, and a sentence was now pronounced in their favour, or at least as containing no doctrines nor precepts inconsistent with the true Catholic faith or good morals. Moreri.

OLIVE-Tree, in *Botany*. See OLEA.

OLIVE Gum. See GUMMI *Olivæ*.

OLIVE, *Spurge*. See SPURGE *Laurel*.

OLIVE, *Wild*. See OLEAGNUS.

OLIVE, *Barbadoes Wild*. See BONTIA.

OLIVE-Colour is a yellow mixed with black.

The term is chiefly used in speaking of the tincture of the complexion: the Spaniards and Indians are rarely white, generally olive-complexioned.

OLIVE *Island*, in *Geography*, a small island in the Mergui Archipelago, hardly a mile in circumference; captain Forrest found on this island some trees of the true olive. N. lat. 11° 20'.

OLIVECRANTZ, JOHN PAULIN, in *Biography*, known as a member of the council of Christina, queen of Sweden, was the son of a Swedish archbishop, and born in 1633. He was carefully instructed by his father in classical learning, and made very considerable progress in his studies. In 1658 he was appointed secretary of legation to Frankfort, in order to be present at the election of the emperor. He was afterwards sent ambassador to Nimeguen, to assist in the negotiations for peace; and in 1680 was made governor of Revel, and supreme judge of Gothland. He was in high favour with Christina, who commanded him to prefix to his title the qualification of excellency, a circumstance which gave rise to much jealousy, and excited against him a host of enemies. The queen corresponded with him after her abdication, and endeavoured to persuade him to follow her to Rome. He died at Stockholm in 1707, and is esteemed by his countrymen as one of their best Latin poets. His principal works are "Oratio in Laudes Reginae Christinae Græce habita Upsaliæ;" "Magnus Principatus Finlandiæ Epico Carmine depictus Oratione Græca Holmiæ." Gen. Biog.

OLIVEIRA *de Bairro*, in *Geography*, a town of Portugal, in the province of Beira; 21 miles N. of Coimbra.

OLIVEIRA *de Condé*, a town of Portugal, in the province of Beira; 12 miles S.W. of Viseu.

OLIVENÇA, a town and fortrefs of Portugal, in Alentejo, on the borders of Spain; to which country it was ceded by the peace of Badajoz, signed June the 6th, 1801; 13 miles S. of Elvas. N. lat. 38° 30'. W. long. 6° 50'.

OLIVER, ISAAC, in *Biography*, one of the first Englishmen who rose to any tolerable degree of eminence in the art of painting; the first rudiments of which he imbibed from N. Hilliard; but was principally indebted for in-

structions to Frederic Zuccherò. He was born in 1556. His principal employment was in portraits, and those in miniature, which he wrought with great resemblance to nature in form and character, and his touch was uncommonly delicate. He sometimes employed himself in making drawings upon a large scale, and also in painting in oil colours; but to neither of these is he indebted for his reputation so much as to his miniatures. Many very fine ones of his painting still remain in possession of the nobility of this country.

Dr. Meade's collection was very rich in them; one of queen Elizabeth, others of Mary queen of Scots, Henry prince of Wales, Ben Johnson, and sir Philip Sidney, at whole length, sitting under a tree: these were all purchased by the king's father, Frederic prince of Wales, and now form a part of his majesty's collection. They are most to be admired for their extreme neatness and truth; with a tasteful expression of feature rarely found in portraits; but their actions are void of grace, and exhibit the general want of taste in art at that period. He died in 1617, aged 61.

OLIVER, PETER, the son and disciple of Isaac Oliver, was born in 1601, and succeeded his father in the profession of miniature painting, confessedly even more successful than him or any of their contemporaries. His pictures, like his father's, are spread among the houses of the nobility and gentry, and are alike justly esteemed. The works which he executed upon a larger scale are much more valuable than those of his father, and are also more numerous, though not very frequently to be met with. Walpole mentions that there were thirteen works of Peter Oliver in the collection of Charles I. and of James II.; and that seven of them are preserved in queen Caroline's closet at Kensington; and he also speaks of a portrait of Mrs. Oliver by her husband, in possession of the dukes of Portland, as being of uncommon quality. He died in 1660.

OLIVERI, in *Geography*, a river of Sicily, which runs into the sea, between Patti and Milazzo.

OLIVES, *Mount of*, or *Mount OLIVET*, in *Biblical Geography*, a mountain of Palestine, which is situated about a mile distant from Jerusalem, and commands the prospect of the whole city, from which it is parted by the brook Kidron, or Cedron, and the valley of Jehoshaphat. This is not a single hill, but rather part of a long ridge, with three, or, according to Pococke, four, heads or summits, extending from N. to S.; the middlemost of which is that from which our Saviour ascended into heaven. On this summit is a small round church. Here was formerly a magnificent church, built by the empress Helena, in memory of Christ's ascension; but there now only remains a Gothic octagonal cupola, about eight yards in diameter. The natives have here two altars; and the Greeks, Copts, and Armenians, one each, in which they say mass; but Christians of every description have free access to the place throughout the whole year, upon paying a certain caphar, or tribute. Every place that is shewn upon this mountain has either a church, chapel, or oratory, to feed the devotion of pilgrims, and the indigence of the monks that reside upon the spot. The second summit of the mountain, towards the S., is that called the "Mount of Corruption or Offence." The third, towards the N., which is the highest summit of all, and stands about two furlongs from the middlemost, is that which was most commonly styled the "Mount of Galilee." Here are also shewn many places mentioned in the gospel; such as that where Christ mounted the ass; where he wept over Jerusalem, &c. These are still visited by multitudes of Christians of all sorts; though the Latins have the possession of them, and perform the particular ceremonies that belong

belong to each respective place; *e.g.* on Palm Sunday, the monks and priests attend their superior from the place where Christ, mounted on an ass, proceeded to Jerusalem. He is dressed in his pontifical habit, mounted also on an ass, and accompanied by crowds of spectators, who cut down and strew branches before him, and make the air resound with their harangues. The mount of Olives was originally called by the Jews the "Mount of Unction," on account of the great quantity of oil that was made from the olives that grew upon it; but when Solomon had once defiled it, by erecting sundry temples to the gods of the Ammonites, Moabites, &c. in complaisance to his strange wives, they changed the name of it by a small alteration of the letters, that is, of *שֶׁרָה* into *מִשְׁחָה*, into another, which signifies the "Mount of Corruption, Destruction, or Offence." The Greeks, however, have retained its ancient appellation of *Ὄρος ἐλαιῶν*, or *Ὄρος τῶν ἐλαιῶν*, mount of olives.

The evangelist Luke, supposed to be the writer of the Acts, as well as of the gospel that bears his name, has been charged by one advocate of the cause of infidelity, with having contradicted himself; for in his gospel he tells us, that Jesus ascended into heaven from Bethany; and in the Acts of the Apostles he informs us, that he ascended from mount Olivet. This objection proceeds, as the learned bishop of Landaff has observed in his excellent "Apology for Christianity," either from ignorance of geography, or ill-will to Christianity; and he recommends to the writer to recollect for the future, that Bethany was not only the name of a town, but also of a district of mount Olivet adjoining to the town.

OLIVET, JOSEPH THOULLIER D', in *Biography*, an estimable man of letters, was born in 1682 at Salins, in Franche Compté. He was educated by his father, who was afterwards a counsellor in the parliament of Besançon, and at an early age he entered among the Jesuits, in which society he had an uncle distinguished for his learning. During his continuance among the Jesuits, he frequently visited Boileau, and his admiration of the poet caused him to imbibe his principles of literature. The taste which he acquired was rather manly and austere, than refined; and it was accompanied with a corresponding bluntness of manners and address. The example of his friend led him to make trial of his powers in French verse; but in the maturity of his judgment he committed all his poetry into the flames. He exercised himself in compositions for the pulpit; and in order to form his taste for oratory on the best models, he became a very assiduous student of the works of Cicero. He was invited to undertake the tuition of the prince of Asturias in Spain, which he declined, preferring the ease and independence of a private station to a brilliant servitude. At the age of thirty-three he quitted the society of the Jesuits, and thenceforward devoted himself to the life of a man of letters at Paris, and in 1723 he was elected into the French academy. The first work which he committed to the press was a translation of Cicero, "De Natura Deorum." After this he published the Tusculan questions, and the orations against Catiline: and, at a subsequent period, he collected from the works of Cicero those passages which he thought best calculated, as well to form the literary taste of young persons, as to inspire them with useful moral principles, and published them in a translation, under the title of "Pensées de Cicéron, pour servir à l'Education de la Jeunesse." A complete edition of the works of his favourite author was an object that long and deeply engaged his attention, which he at length brought out at Paris, under the patronage of the government, in nine volumes 4to. An edition of this work was published at Geneva in 1758, which is in

the highest estimation, is very rare, and fetches a very high price. To each volume are attached tables, particularly an useful one, containing all the various readings collected from the principal editions of Victorius, Manutius, Lambinus, and Gruterus, together with those proposed by Olivet in his Commentaries. Of the edition, by this editor, the biographer says, "it is the character that it performs more than it promises. Besides a very correct text, it contains a very judicious collection of notes by the best commentators, with a learned and well-written preface of his own." In the Geneva edition, the errors that had escaped M. Olivet are carefully corrected.

Olivet was a diligent student of the grammar of his own language, and published a treatise on "French Prosody," in which he attempted to prove that almost all French syllables have a determinate measure, and are as susceptible of quantity as those of Greek and Latin. This was succeeded by "Remarques de Grammaire sur Racine." His attachment to the French academy led him to write the history of that body in continuation of that of Pellisson. This work, which comes down to the commencement of the 18th century, is valuable for the accuracy of its researches, and the interesting anecdotes preserved in it. He published "Opuscules sur la Langue Française," to which he added the abbé de Choisy's "Journal of Discussions," on points of grammar, at the sittings of the academy. He was a most regular attendant on the meetings of the French academy, and on his return from one of them, in October 1768, he was attacked with a fit of apoplexy, which terminated his life at the age of 86.

As a translator, Olivet is faithful and elegant: to his version of the treatise "De Natura Deorum," he annexed a tract of his own relative to ancient philosophy, which he entitled "Theologie des Philosophes," to which theology, according to D'Alembert, his philosophical knowledge was in a great measure limited. The abbé d'Olivet was ever ready to perform good offices for his literary brethren, and through his means many scholars obtained eligible and respectable situations in life. He had familiar access to cardinal Fleury, the prime minister, and the bishop of Mirepoix, the distributor of ecclesiastical benefices, who could not but admire the interest which he took in obtaining favours for others, while he asked nothing for himself. He preserved to the end of his life the intimate friendship of several persons of eminence, and though sparing in his approbation of modern productions, he appears to have been free from envy and jealousy. In his mode of living he was moderate and economical; and he sacrificed the greatest part of his patrimony to the advantageous settling of his nephews. Gen. Bog.

OLIVET, in *Geography*, a town of France, in the department of the Loiret, and chief place of a canton, in the district of Orleans, situated on the S. side of the Loire; 3 miles S. of Orleans. The place contains 3250, and the canton 7102 inhabitants, on a territory of 185 kilometres, in 7 communes.

OLIVETAN, ROBERT, in *Biography*, the first person who published a version of the scriptures in the French language, from the original Hebrew and Greek Septuagint, for the use of the inhabitants of the Valais. Of his history nothing is known, except that he was a relation of John Calvin, and he is said to have been poisoned at Rome in the year 1536. His translation was printed at Neuchâtel in 1535, and was the foundation of the Geneva version in common use, after it had gone through various revisions by Calvin, Beza, and others. The character of Olivetan's impression is Gothic: he is said to have committed many mistakes,

mistakes, but it was no small thing gained to have the scriptures, in any way, given in the vernacular language of the country. Calvin's first revised edition of this translation came out at Geneva in 1550. copies of which, as well as of Olivetan's in the Gothic character, are now exceedingly scarce.

OLIVIER, SERAPHIM, a learned French ecclesiastic, who was promoted to the purple in the early part of the seventeenth century, was born at Lyons in the year 1538. He studied the civil and canon law at Bologna, after which he went to Rome, and obtained the patronage of pope Pius IV., who made him auditor and dean of the *Rota*, which posts he retained during forty years. He was employed as nuncio by popes Gregory XIII., Sixtus V., and Clement VIII., of whom the latter, in 1604, bestowed upon him the title of patriarch of Alexandria, and raised him to the sacred college, at the recommendation of king Henry IV. He was likewise nominated to the bishopric of Rennes in Brittany. He died in 1609, at the age of seventy-one. He prepared for the press "*Decisiones Rotæ Romanæ*," which were printed at Rome in 1614, in two volumes folio, and were reprinted at Frankfort in the following year. Moreri.

OLIVIER, CLAUDE MATTHIEU, advocate of the parliament of Aix, was born at Marseilles in 1701. He was brought up to, and successfully practised at the bar. He possessed a quick and lively genius; and at any time, a few hours retirement from society was sufficient to enable him to speak and write, even on important causes. He was a man of great talents, but took little pains to improve them; he was given to excess in almost every thing; he would employ a fortnight in studying the Code and the Digest, or in storing his mind with the beauties of Demosthenes, Homer, Cicero, or Bossuet, and then abandon himself to a life of frivolity and dissipation. He died in 1736, at the age of 35. He had a chief hand in the establishment of the academy of Marseilles, and was of course one of its original members. He published (1) "*L'Histoire de Philippe Roi de Macedoine, et Père d'Alexandre le Grand*," in two vols. 12mo. No writer, it is said, has so ably handled the history of the age of Philip, the interests of the different nations of Greece, and their manners and customs, but the conduct of the work is extremely defective; the digressions are frequent and tedious, and the style is not suitable to a history. A disease of the brain, with which he was attacked, and under which he laboured a long time, prevented him from putting his last hand to this work. 2. "*Mémoire sur les Secours donnés aux Romains par les Marseillois pendant la seconde Guerre Punique*." 3. "*Mémoire sur les Secours donnés aux Romains par les Marseillois durant la Guerre contre les Gaulois*."

OLIVIN, *Volcanic Chrysolite, Peridot granuliforme*, Haüy, in *Mineralogy*, a species of *Chrysolite* (see *CHRYSOLEITE*), the colour of which is between asparagus and olive-green, and which, by exposure to the weather, becomes yellowish-brown. It occurs imbedded in basalt, sometimes in rounded pieces, and rarely in rectangular prisms. Its lustre varies internally between glimmering and shining, and is vitreous, passing into resinous. Its fracture conchoidal, passing into splintery and uneven, and its fragments indistinctly sharp-edged. In large pieces it exhibits granular distinct concretions. It varies from semi-transparent to translucent; it is hard, but less so than quartz; brittle and easily frangible. Sp. gr. 3.22 to 3.26: nearly infusible before the blowpipe, without addition, and loses its colour by digestion in nitric acid. The analysis of it by Klaproth is as follows:

48.	to 52.	Silex
37.	— 38.5	Magnesia
0.25	— 0.20	Lime
12.5	— 12.	Oxyd of iron

Loss
97.75
2.25

100.

It is easy of decomposition, and to this circumstance many basalts owe their porous texture. Olivin is found very abundantly in Bohemia and other parts of Germany, and also in France, Britain, Norway, and Sweden. Aikin's Dict.

OLIZAROWSTOW, in *Geography*, a town of Poland, in the palatinate of Brzesc; 14 miles E. of Brzesc.

OLKILUOTO, a small island on the E. side of the gulf of Bothnia. N. lat. $61^{\circ} 15'$. E. long. $21^{\circ} 15'$.

OLKINIKI, a town of Lithuania, in the palatinate of Troki; 22 miles S. of Troki.

OLKOWITZ, or ALEXOWICE, a town of Moravia, in the circle of Znaim; 9 miles N.E. of Znaim.

OLKUSZ, or ILKUSK, a town of Poland, in the palatinate of Cracow; formerly celebrated for its mines; 16 miles N.W. of Cracow.

OLLA, a river of Germany, which runs into the Weser; 17 miles below Bremen.

OLLA, in *Mythology*, was the pot in which the priests boiled the portion of the victims that was allotted to them.

OLLBRUCKEN, in *Geography*, a town of France, in the department of the Rhine and Moselle, late the capital of a lordship, in the electorate of Cologne; 18 miles N.W. of Coblenz.

OLLERIA, a town of Spain, in the province of Valencia; 5 miles S. of St. Felipe.

OLLEROS POINT, a cape and harbour on the coast of Peru; S. lat. $14^{\circ} 36'$.

OLLET, in *Rural Economy*, a term applied to fuel of any kind.

OLLIERGUES, in *Geography*, a town of France, in the department of the Puy-de-Dôme, and chief place of a canton, in the district of Ambert; 9 miles N.N.W. of Ambert. The place contains 1760, and the canton 7192 inhabitants, on a territory of $147\frac{1}{2}$ kilometres, in 5 communes.

OLLILOULES, a town of France, in the department of the Var, and chief place of a canton, in the district of Toulon; 4 miles W. of Toulon. The place contains 2591, and the canton 14,363 inhabitants, on a territory of 195 kilometres, in 6 communes.

OLLYA, a town of Bengal; 30 miles S.W. of Ragonatpour.

OLMAN, a small island on the W. side of the gulf of Bothnia. N. lat. $61^{\circ} 38'$. E. long. $17^{\circ} 11'$.

OLMEDILLA, a town, or rather village, of Spain, in New Castile, situated on the road from Madrid to Valencia, and half way on the royal route leading to those two capitals.

OLMEDO, a small town of Spain, seated on an eminence in front of an extensive plain: it was formerly surrounded by walls, of which some remains are still visible; it has seven parochial structures, and as many religious houses. The principal altar of St. Mary's church is adorned with good paintings. The population of this place was more considerable, but is now reduced to the number of 2000 inhabitants, who carry on no other traffic than

than that which is derived from their brick-kilns. In its vicinity are some vineyards and kitchen-gardens. It is under the administration of a corregidor; 16 miles S. of Cuença.

OLMESSA, a town of the island of Corfica; 5 miles N.E. of Corfe.

OLMESTA, a town of Sweden, in East Göthland; 30 miles S.W. of Ljökipping.

OLMETO, a town of the island of Sardinia; 7 miles N. of Alghieri.—Also, a town of the island of Corfica; 7 miles W. of Tallano.

OLMETTA, a town of Corfica; two miles S.W. of Oletta.

OLMOS, FR. ANDRES DE, in *Biography*, was born near Oria, in the district of Burgos, in the latter part of the fifteenth century, and was brought up in the house of a married sister at Olmos, near Valladolid, from which place he took his name. At the age of twenty he took the Franciscan habit in the convent at Valladolid. He distinguished himself by his application to theological studies, and was sent by Charles V. as one of the inquisitorial commissioners against the witches of Biscay. He acquitted himself so much to the satisfaction of his companion Zumarraga, that when the latter was appointed bishop of Mexico, in 1528, he took Olmos with him to the new world. Here his zeal was wisely directed, and he began a series of labours which entitle him to the respect of posterity. He found it necessary to learn four languages, viz. the Mexican; the Totonaca; the Tepehua; and the Guasteca. Of the two first he wrote grammars and vocabularies, which have been of essential service to other missionaries. He was author of very many religious tracts, in the different languages of the tribes among whom he passed the greater part of his life, enduring with patience and fortitude every kind of privation and difficulty. He lived, however, to a great age, and died in October 1571. He is ranked among the poets of Spain, having translated into Castilian verse a Latin work upon Heresy, by Alonso de Castro. Gen. Biog.

OLMUS, in the *Instrumental Music of the Ancients*, the name of one of the joints of the ancient flutes, and probably the upper joint or embouchure. See BOMBYX.

OLMUTZ, in *Geography*, a city and capital of the marquisate of Moravia, and of a circle of the same name, seated on the river Morawa, the first royal borough and see of a bishop, surrounded by the river. It is a fortified, well-built, and populous town; divided into the Old and New Town, and containing twenty-six churches, five chapels, seven cloisters of monks, and two of nuns, several hospitals, a correction and an orphan-house, a college and seminary, an university, founded in 1567, a riding academy, and a learned society. The castle is strong, and has often served as a state prison; 80 miles N.N.E. of Vienna. N. lat. 49° 33'. E. long. 17° 11'.

OLNEY, or OULNEY, a market town and parish in the first division of the three hundreds of Newport, and county of Buckingham, England, is situated on the north bank of the river Ouse, near the borders of Northamptonshire, and at the distance of fifty-six miles from the metropolis. The houses in the town, except those of late erection, are mostly covered with thatch, and chiefly ranged in one long street. In 1786, a fire happened here, which destroyed forty-three large tenements, and occasioned other considerable damage. The church is a large ancient structure, in the pointed style, adorned with a handsome tower and spire, the latter rising to the height of 185 feet. In the cemetery formerly stood a chapel, dedicated to the Virgin Mary, in which was a chantry, founded by lord Basset. Lace-making constitutes the chief employment of

the inhabitants of Olney. The market is held on Monday every week, and there are three fairs annually. According to the parliamentary returns of 1811, this town and parish contain 484 houses, and a population of 2268 persons. Previous to the year 1767, the parish of Olney was one entire common, but at that period it was inclosed under the authority of an act of parliament. The manor anciently belonged to the earls of Chester, from whom it passed to the two families of Albini and Basset. It afterwards became the property of Thomas Mowbray, duke of Norfolk, after whose banishment the king granted it to Edward, duke of York, who was slain at the battle of Agincourt. Upon this event it reverted to the crown, and continued part of the royal demesnes till the year 1638. Its present proprietor is the earl of Dartmouth.

Weston-Underwood, a small village situated about a mile south from Olney, was long the residence of the celebrated poet Cowper, who died here on the 25th of October 1800. Many descriptions in his poem of the Task were drawn from the scenery adjoining to this town. At Lavendon, two miles to the north, formerly stood an abbey for Premonstratensian monks, founded by John de Bidun, a baron, in the reign of Henry II. This place appears to have been anciently of much more importance than at present, as it had a weekly market and an annual fair; and was protected by a castle, some vestiges of which can still be traced. Ravenston, to the west of Olney, is noted as the birth-place of the great lord chancellor Nottingham, who was styled by his contemporaries the English Cicero, and who is characterized by the late sir William Blackstone as a lawyer of first rate abilities and sterling integrity. He died in 1682, after having been advanced to the dignity of an earl, and lies buried in the church of this village, where is a magnificent monument erected to his memory by his son. His effigy is finely executed in white marble, in his chancellor's robes, and reclines under a canopy supported by four black marble pillars of the Corinthian order. Magna Britannia, by the Rev. Dan. Lysons, A.M. F.R.S. and Samuel Lysons, esq. F.R.S. 4to.

OLOBOK, a town of the duchy of Warsaw; 12 miles S. of Kalisch.

OLOC, in *Natural History*, a name given by the people of the Philippine islands to their quail. It is like our's in all respects, but much smaller.

OLOCENTROS, a name given by the old Greeks to a small animal of the spider kind, whose bite was accounted mortal. It is the same with the *solipuga*, so called from its stinging, or biting most violently, in places, or seasons, where the sun had the most power, as Africa, &c. The name *solipuga* was a corrupt way of writing that word, and this seems also a false way of writing the word *heliocentros*, which signifies the same as *solipuga*.

OLOMPAN, in *Geography*, a town of Mexico; 40 miles E.N.E. of Mexico.

OLONA, a river of Italy, which runs into the Po; 12 miles W. of Piacenza.—Also, the name of one of the twelve departments of Italy, formerly a part of the duchy of Milan, which is divided into four districts, and contains above 193,189 inhabitants, who elect fifteen deputies. The capital is Milan.

OLONEI, an island near the S. coast of Nova Zembla, in the straits of Vaigatskoi. N. lat. 70° 30'. E. long. 58° 29'.

OLONETZ, a town of Russia, built by Peter I., in which is an iron forge, and in its vicinity are mines of copper and iron, and a mineral spring; 104 miles N.E. of Petersburg. N. lat. 61° 10'. E. long. 32° 38'.

OLO-

OLONETZKOI, a government of Russia, bounded on the N. by the government of Archangel, on the E. by the same and the White sea, on the S. by that of Novgorod and Vologda, and on the W. by that of Viborg and Finland; about 340 miles from N. to S. and in its greater breadth from E. to W. 240 miles; but along the White sea its mean breadth is about 100. Olonetz, from which it derives its name, is the capital. N. lat. $61^{\circ} 40'$ to $66^{\circ} 40'$. E. long. 28° to 41° .

OLONNE, *SABLES D'*. See *SABLES d'Olonne*.

OLONSKA, a town of Russia, in the government of Irkutsk; 48 miles S.E. of Balaganiskoi.

OLONZAC, a town of France, in the department of the Herault, and chief place of a canton, in the district of St. Pons; 15 miles S. of St. Pons. The place contains 850, and the canton 6716 inhabitants, on a territory of $257\frac{1}{2}$ kilometres, in 13 communes.

OLOPHRYME, in the *Musie of the Ancients*, according to Athenæus, was the title of funeral songs with the Greeks.

OLOSOTAI, in *Geography*, a town of Asia, in the country of Hami; 20 miles N.N.W. of Tche-tcheou-Hotun.

OLOST, a town of Spain, in Catalonia; 9 miles W.N.W. of Vique.

OLOSTELESEK, a town of Transilvania; 22 miles N.N.W. of Cronstadt.

OLOT, a town of Spain, in Catalonia; 17 miles N.W. of Girona.

LOU-HOCHO, a town of Chinese Tartary; 38 miles S.S.W. of Soubarkan.

OLOUS, a town of Asiatic Turkey, in Natolia; 12 miles E. of Amasreh.

OLPE, a town of Germany, in Westphalia; 37 miles E. of Cologne. N. lat. $50^{\circ} 59'$. E. long. $7^{\circ} 59'$.

OLPHEN, a town of Germany, in the bishopric of Munster; 17 miles S.S.W. of Munster. N. lat. $51^{\circ} 42'$. E. long. $7^{\circ} 28'$.

OLRICK, a town of Scotland, in the county of Caithness; 6 miles E.S.E. of Thurso.

OLSCHANKA, a town of Russia, in the government of Ekaterinoflav; 40 miles S.W. of Novo-Mirgorod.

OLSZTYN, a town of Poland, in the palatinate of Cracow; 40 miles N.W. of Cracow.

OLTEN, a small town of Switzerland, in the canton of Soleure, whither the meeting of the Helvetic Society is now transferred. This society consists of the most learned men of the country, both of the Catholic and Reformed religion, who first contributed to extend the spirit of toleration, and to lessen that antipathy which subsisted between the members of the two persuasions. It first met at Schintznach, agreeably situated on the banks of the Aar, and noted for its tepid and mineral waters. The town of Olten was purchased by the canton of Soleure in 1532; 17 miles E.N.E. of Soleure.

OLTENPACH, a town of the duchy of Stiria; 16 miles S.E. of Voitsberg.

OLTIFI, a town of Asiatic Turkey, in the government of Kars; 30 miles N. of Kars.

OLTRI, a town of Italy, in Friuli; 38 miles N.W. of Friuli.

OLTSCHIN, a town of Austrian Poland; 52 miles N.N.W. of Cracow.

OLU JACHSEB, a town of Arabia, in the province of Hadramaut; 136 miles S.W. of Amanzirifdin.

OLUTOR, a river of Russia, which runs into the North Pacific ocean. N. lat. $61^{\circ} 10'$. E. long. $167^{\circ} 54'$.

OLUTOROVSKOI, a town of Russia, on the fore-mentioned river, on the coast of the Pacific ocean; 164 miles E. of Oklausk. N. lat. $61^{\circ} 30'$. E. long. $167^{\circ} 54'$. — Also, a cape of Russia, in the North Pacific ocean; 100 miles S. of the town of Olutorovskoi. N. lat. $59^{\circ} 50'$. E. long. $168^{\circ} 54'$.

OLYBRIUS, in *Biography*, a short-lived emperor of the West, had been invested with the consular dignity by Leo, emperor of the East. When the powerful count Ricimer had resolved on the deposition of the emperor Anthemius, he proposed to raise Olybrius to the high dignity, who was also supported by Genferic, king of the Vandals. Ricimer laid siege to Rome, put to death Anthemius, though his father-in-law, and ordered Olybrius to be proclaimed emperor, A.D. 472. This elevated station he enjoyed a very short time. Ricimer, who had caused the death of three emperors, died, and Olybrius soon followed him, after a reign of only a few months. Gibbon, in describing the siege and assault of Rome just referred to, says, "forty days after this calamitous event, the subject, not of glory, but of guilt, Italy was delivered, by a painful disease, from the tyrant Ricimer, who bequeathed the command of his army to his nephew Gundobald, one of the princes of the Burgundians. In the same year, all the principal actors in this great revolution were removed from the stage, and the whole reign of Olybrius, whose death does not betray any symptoms of violence, is included within the term of seven months. He left one daughter, the offspring of his marriage with Placidia, and the family of the Great Theodosius, transplanted from Spain to Constantinople, was propagated in the female line as far as the eighth generation." Gibbon's Hist. vol. vi.

OLYKA, in *Geography*, a town of Poland, in Volhynia; 22 miles N.E. of Lucko.

OLYMPIA, in *Ancient Geography*, a celebrated city of Greece, in Triphylia, situated on the river Alpheus, N. of Hypana. It is not certain whether this city had in former times borne the name of "Pisa," or whether they were distinct cities. Of all the cities of Greece this was the most famous on account of the games which were instituted in it, and which drew thither a prodigious concourse of people. (See *OLYMPICS*.) At Olympia there was a grove of olives, consecrated to Jupiter, and which was called "Altis." The temple of the Olympian Jupiter surpassed all others in beauty, and the statue of this deity which graced this temple was the most magnificent of all the works of Phidias, the principal sculptor of Greece. Its height was sixty feet: it was formed of gold and ivory, and held in such estimation, that it was thought a misfortune for any one to die without having seen this statue. The deity was represented in a sitting posture, with a crown of olive on his head, holding in one hand victory, and in the other a sceptre, surmounted with an eagle. The sandals of the god, and also his robe, are of gold. His throne is diversified with gold and precious stones, with ebony and ivory, and painted with the representations of divers kinds of animals. About it are also many figures in sculpture; e.g. four victories in the attitude of dancers, round the upper part of each leg of the throne, and two more at each of the feet. On those legs also which support the fore part of the throne, are carved sphinxes, devouring the Theban children, and under the sphinxes, Apollo and Diana slaying with their arrows the children of Niobe. The basis or pedestal, which sustains the whole work, is enriched with many other ornaments and figures in gold, all of which have some relation to Jupiter; such as the Sun mounting his chariot, attended by Jupiter and Juno, and one of the Graces;

Graces, next to whom stands Mercury, and next to Mercury Vesta; after Vesta is seen Cupid receiving Venus arising out of the sea, and the goddess Persuasion placing a crown on the head of Venus. Here are also the figures of Apollo and Diana, of Minerva and Hercules, and on the lowest part of the basis, Neptune and Amphitrite, and the Moon riding on a horse. Jupiter, as the Eleans say, was so pleased with Phidias, the statuary, for this performance, that, in compliance with his wishes, he testified his approbation by causing the pavement to be struck with lightning, upon which place a brazen urn was fixed as a permanent memorial of the miracle. Phidias is said to have been assisted in the composition, the colours, and particularly the drapery of this statue, by Panæus, a painter, his brother and fellow-workman, many of whose admirable paintings were seen in various parts of the temple. Tradition reports; that Phidias, being asked by Panæus, by what pattern or idea he intended to frame his image of Jupiter, answered, by that given in the following verses of Homer, lib. i.

“ This said, his kingly brow the Sire inclin’d,
The large black curls fell, awful, from behind,
Thick shadowing the stern forehead of the god;
Olympus trembled at th’ almighty nod.”

The temple was of the Doric order, and the place in which it was constructed formed a fine peristyle, being every where encompassed by columns; its elevation was 68 feet, its length 230, and its breadth 95. Its architect was Libon, a native of this country, the roof was of fine pentelic marble, cut in the form of tiles. From the middle of the roof hung a gilded victory, and under this statue a golden shield, on which was represented Medusa’s head. On the outside above the columns a rope went round the temple, to which were fastened twenty-one gilt bucklers, consecrated to Jupiter by Mummius, after the taking of Corinth. Within and about the temple were innumerable ornaments, consisting of statues, paintings, and columns charged with trophies. Among the statues were several of Parian marble, of which some had been erected in honour of the emperor Adrian by the cities which composed the state of Achaia, and others to Trajan by the whole Greek nation. The city of Olympia was indebted to Trajan for several of its embellishments, particularly the baths, which bore his name, an amphitheatre, a horse-course, two stadia in length, and a senate-house for the Roman magistrates, ceiled with bronze. Most of the Athletæ had their statues at Olympia, several of which were executed by Phidias. For other particulars we refer to Pausanias, lib. v.

OLYMPIAD, *Ὀλυμπιας*, in *Chronology*, a space or period of four years; by which the Greeks reckoned their time.

Historians have said that the Olympiad was instituted by Iphitus; but it is certain, that the tetraeteris, or period of four years, was almost as old as the religions of Greece, being used in several of their sacra, or religious festivals. From Scaliger (*Animadv. ad Euf. Chron. N° 1241.*) we learn, that the Greeks, inquiring of the Delphic oracle concerning their solemn feasts and sacrifices, received for answer, that they would do well to sacrifice *κατὰ τὰ παλαιά, καὶ κατὰ τὰ νέα*, according to the custom of their fathers, and according to three things; which last words they interpreted to signify days, months, and years. They accordingly fast themselves to regulate their years by the sun, and their months and days by the appearances of the moon. Thus they hoped to observe their festivals, and offer their sacrifices upon the same days and the same months in the year; and

thus to please the gods, and to fulfil the intention of the oracle. After trying many forms and combinations of years for this purpose, they made their year to consist of 360 days, with two additional days, and their months of 30 days each, from one of which, however, in the course of four years, they took a day; by this means their tetraeteris amounted to 1447 days. Sometimes a whole month was intercalated, and then the tetraeteris consisted of 1477 days. In this way they flattered themselves that the oracle was fulfilled; for they sacrificed according to the year and the month, because the month was full, as consisting of 30 days; and the years thus made up of complete months, by means of these intercalations, returned to their beginnings, nearly in the proposed order. Hence it was, that the great festivals of the Greeks were solemnized every fifth year, after an interval of four complete years; as, *e. g.* the panathenæa at Athens, and the Olympic games in Elis, which were celebrated every fifth year upon the full of the moon. By Scaliger’s tables it appears, that the Olympic new moon fell sometimes in the middle, or latter end of July, and sometimes in the beginning of August, for that festival never preceded the summer solstice; which the ancients placed always upon the 9th of July, so that the Olympic moon was the first new moon after the summer solstice. This gave birth to the intercalary month, and occasioned the variation in the tetraeteris, which consisted sometimes of 48 months, sometimes of 49. The utility of the Olympiad as an established era in the Greek chronology and history is well known, and, indeed, Scaliger triumphs with no small degree of exultation in the imagined success of his researches with regard to this period. “Hail,” says he, “venerable Olympiad! thou guardian of dates and eras! Asserter of historical truth, and curb of the fanatical licentiousness of chronologists! &c. &c.” Nevertheless, chronologists are far from being agreed about the precise time at which the Olympiads began; some dating them from the victory of Coræbus the Elean, and others throwing their original 13, and even 28 Olympiads farther backward. This was done by artificial chronologists, who, in order to accommodate the Olympiads to their systems and computations, have added to their antiquity 112 years, as sir Isaac Newton observes, in his “Chronology.” Chronologists, however, in all their computations, agree to reckon downward from that Olympiad in which Coræbus the Elean was conqueror, the first year of which was the 776th B. C., meaning, according to Scaliger, July the 23d. See *ΕΡΟΣΙΑ*.

Rome was built, according to Varro, in the fourth year of the sixth Olympiad.

The Peloponnesian war began May the 7th in the second year of the 87th Olympiad. Alexander the Great died April the 21st, in the second year of the 114th; and Jesus Christ was born in the fourth year of the 193d Olympiad, four years before the common era.

The Olympiads were also called *anni Iphiti*, from *Iphitus*, who instituted, or at least renewed, the solemnity of the Olympic games.

We do not find any computation by Olympiads after the 364th, which ended with the year of Christ 440. Except that in a charter of our king Ethelbert, the years of his reign are said to be reckoned by Olympiads.

OLYMPIAS, in *Biography*, a celebrated woman, was daughter of the king of Epirus, who married Philip, king of Macedonia, by whom she had Alexander the Great. Her haughtiness, and more probably her suspected infidelity, obliged Philip to repudiate her, and marry Cleopatra, the niece of king Attalus. Olympias was sensible of this injury, and Alexander shewed his disapprobation of his father’s

measures, by retiring from the court to his mother. The murder of Philip, which some have attributed to the intrigues of Olympias, was productive of the greatest extravagancies. The queen paid the greatest honour to her husband's murderer. She gathered his mangled limbs, placed a crown of gold on his head, and laid his ashes near those of Philip. The administration of Alexander, who succeeded his father, was in some instances offensive to Olympias; but when the ambition of her son was concerned, she did not scruple to declare publicly that Alexander was not the son of Philip, but that he was the offspring of an enormous serpent, who had supernaturally introduced himself into her bed. When Alexander was dead, Olympias seized the government of Macedonia; and, to establish her usurpation, she cruelly put to death Aridæus, with his wife Eurydice, as also Nicanor, the brother of Cassander, with a hundred leading men of Macedon, who were inimical to her interest. Such barbarities did not long remain unpunished: Cassander besieged her in Pydna, where she had retired with the remains of her family, and she was obliged to surrender, after an obstinate siege. The conqueror ordered her to be tried, and to be put to death. A body of 200 soldiers were ordered to put the bloody commands into execution; but the splendour and majesty of the queen disarmed their courage, and she was at last massacred by those who had been injured in themselves, and in their families, by her tyranny. This happened about three hundred and sixteen years before the Christian era. Univer. Hist.

OLYMPICS, or OLYMPIC Games, were solemn games, which lasted five days, famous among the ancient Greeks; instituted, according to some, by Hercules, in honour of Jupiter, and re-established by Iphitus; and held at the beginning of every fifth year, that is, every 50th month, on the banks of the Alpheus, near Olympia, a city of Elis; to exercise their youth in five kinds of combats.

These games became so considerable, that the Greeks made them their epocha; distinguishing their years by the returns of the Olympics.

These games have been held in such reputation, and they are so nearly connected with the history of the Greeks, that their vanity has induced them to ascribe their origin or revival to the most venerable personages of antiquity, such as the Idæan Hercules, Clymenus, Endymion, Pelops, and Hercules, the son of Alcmena; and in order to support these different pretensions, reasons have been sought for, and arguments produced from the religious rites and ceremonies, the laws and customs of this solemnity. Thus, Pausanias says, that these games were ordered to be celebrated every five years, because the brothers, called the Idæi Dactyli, of whom, the Idæan Hercules was the elder, were five in number; to whom, in particular, as also to his four brothers, an altar was consecrated at Olympia by Clymenus, who was descended from this Hercules, and is said to have celebrated these games fifty years after the deluge of Deucalion. The claims of Endymion are founded on the name of his father Aethlius, who is said to have given the appellation of Athletæ to those who contended for the prize denominated Athlon, at these games. As for Pelops, this hero was held in such high veneration at Olympia, that the Eleans in their sacrifices gave him the preferment, even to Jupiter himself, for which they alleged the practice of Hercules, the son of Alcmena; to whose labours, as Pindar informs us, they were indebted for their olive-crown. The Eleans, not contented with a founder, who was mortal by his mother's side, have sought a still more noble and ancient origin, and have named for the authors of these games Jupiter and Saturn; who, as they pretend,

in the very place where these games were afterwards celebrated, wrestled with each other for the empire of the world. Others affirm, that they were instituted by Jupiter, in commemoration of his victory over the Titans; and that Apollo in particular signalized himself by gaining two victories, one over Mercury in the foot race, and another over Mars in the combat of the Cætus. The name of other heroes might be mentioned, who are said to have celebrated these games; the last of whom was Oxyllus, who came into the Peloponnesus with the Heraclidæ. After him followed for long an intermission of the solemnity, that the memory of it was almost lost.

As to the occasions of celebrating the Olympic games, sir Isaac Newton is of opinion, that they were originally celebrated in triumph for victories; first by Hercules Idæus, upon the conquest of Saturn and the Titans; and then by Clymenus, upon his coming to reign in the Terra Curretum; then by Endymion, upon his conquering Clymenus; and afterwards by Pelops, upon his conquering Ætolus; and by Hercules, upon his killing Augeas; and by Atreus, upon his repelling the Heraclidæ; and by Oxyllus, upon the return of the Heraclidæ into Peloponnesus. These opinions may be very well supported by the testimonies of ancient authors. That they were celebrated on occasion of funerals, is an opinion which is sanctioned by a custom, which, as we learn from Homer, Pindar, and all the Greek writers, prevailed very much in those heroic ages. The expence of these games was sometimes defrayed by the relatives and friends of the deceased, and sometimes by the public, who enacted an anniversary solemnization of games in honour of the deceased. To one or other of these customs was probably owing the original of the Olympic games, as well as of those celebrated at the isthmus of Corinth, at Delphi, Nemea, and indeed in every considerable town throughout all Greece. It is not easy to account for the preference given to those celebrated at Olympia; but in this preference all the people of Greece acquiesced, and they agreed to bestow the first honours on the Olympic conquerors. It cannot, however, be pretended, that these games were in any very high estimation before the time of their institution by Iphitus; who reigned as king of Elis, 884 years B. C. and 108 years before what is vulgarly called the first Olympiad. Iphitus may, therefore, very justly be regarded as the founder of the Olympic games. The occasion of their re-establishment is stated as follows; Greece at that time being torn in pieces by civil wars, and wasted by a pestilence, Iphitus, one of the descendants of Hercules, grandson of Oxyllus, and king of Elis, had recourse to the oracle at Delphi for a remedy to the evils which afflicted the country; and was told by the Pythones, that the safety of Greece depended upon the re-establishment of the Olympic games; the non-observance of which solemnity had, as she told them, drawn down the indignation of the god to whom it was dedicated, and of Hercules, the hero by whom it was instituted. She ordered him, in conjunction with the people of Elis, to restore the celebration of that festival, and to proclaim a truce or cessation of arms to all those cities which were desirous of partaking in the games. The other people of the Peloponnesus were ordered by the same Delphic deity to join with the Eleans, and to allow them to hold their festival, and for that purpose to proclaim a cessation of arms. The security and peace which the Eleans thus enjoyed, contributed to render their country rich and flourishing; while the other cities of Greece were destroying one another with mutual and intestine wars; and in this state of tranquillity they were distinguished by great simplicity and innocence of manners.

OLYMPICS.

The office of "Hellandock," or president at these games, was at first exercised by Iphitus alone, and for 200 years continued to be exercised by a single person, who was always of the family of Oxylyus; but in the 50th Olympiad, the superintendency of the games was committed to two, chosen by lot out of the whole body of the Eleans; and in the 75th, the number was increased to nine. Two Olympiads afterwards, a tenth was added; and in the 103d Olympiad, the college of Hellandocks consisted of twelve, corresponding to the tribes of the Eleans. Soon afterwards, the number of tribes and of the Hellandocks was reduced to eight; but in the 108th Olympiad, they were restored to ten, and this number was permanent. The Hellandocks, from the powers that were vested in them, acquired great dignity and authority among the several people of Greece; and in the public execution of their office, they were clothed in purple robes, and carried in their hands, as the usual ensign of magistracy, a wand or sceptre. They took their stations at different parts of the stadium, and the senior had the precedence of the rest. The place in which the Olympic games were exhibited was called the *stadium*; which see. The gymnastic exercises of which these games consisted were five (see GYMNASICS); viz. the foot-race or *stadium*, wrestling or *palé*, the *pentathlon*, the *causus*, and the *pancratium*; which see respectively. Those who were competitors in these exercises were denominated *athletæ*; which see. Those who contended in the horse-races were persons of higher rank and consideration than the *athletæ*; and the spectacle itself was more pompous and magnificent. There were properly but two kinds of horse-races at Olympia, viz. the chariot-race, and the race of riding-horses. See the article CHARIOT.

From the nature of the several exercises, of which the Olympic games consisted, it is natural to conclude, that every one, who fancied himself qualified for obtaining an Olympic victory, was admitted to contend for it. But if it be considered that the Olympic games were part of a religious festival, instituted in honour of the king and father of all the Pagan deities, and solemnized with the utmost splendour and magnificence, by pompous deputations from every state of Greece, that they were attended, either from devotion or curiosity, by a vast multitude of people, and that a victory in these games was productive of many honours and immunities, we shall not be surprised to find that those, who offered themselves as candidates for the Olympic crown, were obliged to submit to several previous conditions, and to pass through such an examination as would exclude all who should in any degree appear unworthy of the honour of contending for the Olympic olive. Some time before the celebration of the games, they gave in their names to one of the Hellandocks, and specified the several exercises in which they proposed to contend. Although the games themselves lasted but five days, the preparation for them took up 30, which were employed in exercising the candidates. The previous preparation was very severe, and the exercises required were more laborious and intense than on any other occasion. For these preparatory exercises a particular place was appointed, which was the old Gymnasium at Elis, where the Hellandocks attended every day. The candidates took an oath, that they had exactly performed every thing required of them, by way of exercise, for ten months, including the 30 days or month spent at Elis. On the opening of the games, the names of all the candidates were proclaimed by a herald, and they were required to answer the following interrogatories; viz. Were they freemen? Were they Grecians? Were their characters free from all infamous and immoral stains? The herald, having pro-

claimed silence, laid his hand upon the head of the candidate, and leading him in that manner along the stadium, demanded with a loud voice of all the assembly, "Is there any one, who can accuse this man of any crime? Is he a robber or a slave? or wicked and depraved in his life and morals?" When the candidate had passed with honour through this public inquiry into his life and character, he was led to the altar of Jupiter, surnamed "Hercius," derived from *hercos* (*αἰχμή*), an oath, from his presiding over oaths. Here the candidates were all sworn upon the limbs of a boar, slain and cut up for that purpose, that they would not be guilty of any fraud or indirect action, tending to a breach of the laws relating to the Olympic games. They swore also to their ten months' previous preparation. Boys, as well as persons of mature age, were allowed to be of the number of candidates. This was an innovation, introduced by the mere authority of the Eleans, in the 37th Olympiad. However, under the age of 12 years they were reckoned too young, and above 17 they were ranked in the class of men.

Ladies were not ashamed to be reckoned in the number of candidates. For a long time, indeed, they were not so much as allowed to be spectators of these contests for glory; and they were liable to the punishment of being cast headlong down the precipices of mount Typæus, if they assisted at the solemnity, or passed the river Alpheus during the exhibition. The more effectually to restrain them, it was ordered that all the masters of the gymnasium, who assisted at these games, should appear naked, as were also all the Olympic candidates; which was without doubt the true reason of this law's being first made, as well as one of the principal causes of its having been ever religiously observed. It was, nevertheless, the peculiar privilege of the priestesses of Ceres to be present. As a recompence to the women for their exclusion from the Olympic games, they had a festival of their own, instituted, as it is said, in honour of Olympian Juno, by Hippodamia, the wife of Pelops. The virgins in this festival contended, properly and gracefully clad, in the foot-races; the course being shortened about one-sixth part; and the conquerers received for her reward an olive crown, and a certain portion of the heifer that was on this occasion sacrificed to Juno. But the most agreeable part of the recompence was the liberty granted to the victorious virgin to have her picture drawn, and hung up in the temple, as a memorial, at the same time, of both her beauty and her glory. The direction of this festival, and the office of presiding at these games, was lodged in 16 matrons, elected for that purpose, two out of each of the eight tribes of the Eleans.

The first reward bestowed upon the conquerors in the Olympic games, and the pledge of many consequent honours, privileges, and immunities, was a chaplet or crown, composed of the branches of a wild olive. (See CROWN.) The last duty performed by the conquerors at Olympia was sacrificing to the twelve gods, who were worshipped two at one altar, and sometimes to Olympic Jupiter in particular. These sacrifices were in some cases performed so magnificently, as to entertain the whole multitude assembled on the occasion. Others, less able or less vain, contented themselves with entertaining only their own friends, or being feasted by them, or perhaps by the Eleans themselves, the superintendants of the Olympic games. At these entertainments, a chorus, accompanied with instrumental music, sung such odes as were composed upon that occasion in honour of the conqueror. Pindar composed odes for this purpose; but he demanded a high price for his performances. For perpetuating the glory of these victories,

the Hellenodicks entered into a public register the names of the conquerors, with the exercise performed, the class of men or boys to which they belonged, and also the number of the Olympiad. They had also the honour of having their statues set up in the Altis, or sacred grove of Jupiter at Olympia. On their return to their own country, they were received with extraordinary tokens of respect and applause; and it was customary for the sacred conquerors to make their entry through a breach in the wall; for which custom Plutarch assigns this reason, *viz.* that a city which is inhabited by men, who are able to fight and conquer, has little occasion for walls. The privilege of a public entry was occasionally granted; but it was restricted to few. A stipend or salary was allotted to the sacred conquerors by their respective cities; and it became due, according to the regulation made by Trajan, from the time of their public entry, and it was continued to them for the remainder of their lives. Another reward conferred upon these conquerors was the honour of the first seat at all public spectacles; besides, they had presents, and a yearly allowance of provisions. The last privilege we shall mention was an immunity from all civil offices, which seems to have been owing to the Roman emperors. To the privileges and honours already recited were sometimes added statues, or other monuments of glory, inscriptions, and even altars, upon which sacrifices were offered to them as to heroes or demi-gods.

This celebrated institution of the Olympic games maintained its reputation for a long period, and actually subsisted for more than 1000 years. Its utility, therefore, in a variety of respects, must be unquestionable. It is obvious at first view, that this institution excited and maintained such an emulation and ardour to excel in all the various exercises which it comprehended, that there was scarcely a town of any note, either in Greece or many other countries, in which there was not a gymnasium, or school of exercise, supported at the public expence, with a view of training up their youth in a manner that was best suited, as they conceived, to make them useful to their country. The gymnastic exercises, of which the Olympic games consisted, contributed to increase the strength and agility of the body, to render them dextrous and valiant in war, to furnish a supply of cavalry when horses were scarce, and the people unskilful in the management of them, to give employment to those whose circumstances might otherwise have made them idle, to induce habits of sobriety and temperance, (see Hor. Art. Poet. v. 412, and also 1 Corinth. ix. 25.) to discourage vice and immorality, to rouse into exercise and keep alive the love of glory, to cherish and preserve a due regard to the reputation of their families and countries, and to promote concord and union among the different people of Greece. Such are some of the principal benefits that resulted from the institution of the Olympic games. To those who wish to see them stated more in detail, we recommend the perusal of "A Dissertation on the Olympic Games," by Gilbert West, esq. LL.D. For the musical contests at the Olympic games, see GAMES.

OLYMPIC FIRE. See FIRE.

OLYMPICI, GLI, the title of the academists of Vicenza, in Italy. See ACADEMY.

OLYMPINION, or NEW ATHENS, in *Ancient Geography*, a town of the island of Delos, so called by its founder, the emperor Adrian. It contained a temple of Hercules, and another consecrated to Neptune; which without doubt were magnificent, as Adrian employed only Athenians in the construction of them.

OLYMPIODORUS, in *Biography*, an Alexandrian

philosopher, who flourished about the year 430, is celebrated for his knowledge of the Aristotelian doctrine, and was the master of Proclus, who attended upon his school before he was 20 years of age. This philosopher is distinguished from a Platonist of the same name, who wrote a "Commentary upon Plato," which was preserved among the MSS. in the royal library at Paris; and "A Life of Plato," of which a Latin version was published by Wendt, with learned notes. He is also distinguished from a Peripatetic of a still later age, who wrote a commentary upon the Meteorology of Aristotle. Enfield's Hist. Phil.

OLYMPIODORUS, a learned Greek commentator on the Holy Scriptures, who was probably at first a monk, and afterwards became a deacon of Alexandria. It is not at all ascertained with accuracy as to the time when he flourished; some placing him in the ninth, others in the eleventh century; but Cave says he ought not to be placed later than the early part of the sixth. He is praised for the excellence of his sermons, with which he edified the church at Alexandria, as well as by the talents which he discovered in the elucidations of the sacred writings. There are extant by him a short "Commentary on Ecclesiastes," in Greek and Latin; "A Commentary upon the Lamentations of Jeremiah," published at Rome, with Origen's Commentary, 1598, 4to.; and "A Commentary upon the Book of Job," the best edition of which was published at London, by Patricius Junius, 1637, folio. Moreri.

OLYMPIONICES, *Ολυμπιονικης*, in *Antiquity*, an appellation given to those who came off victorious in the Olympic games.

The Olympionices were infinitely honoured in their country, as being esteemed to have done it immortal honour. The Athenians particularly were so lavish in their presents to the Olympionices, their countrymen, that Solon found it necessary to restrain their liberality by a special law, which imported, that the city should only give 500 drachmas to the Olympionices; which amounted to about 58 ounces of silver of our weight. See OLYMPICS.

OLYMPIS, in *Ancient Geography*, a strong place on the Peloponnese, near the mountains, on the confines of Laconia and the Argolide. Polybius.

OLYMPIUM, a small town of Sicyonia, east of Asopus, and at a small distance from its mouth. It was famous for the tomb of Eupolis, an Athenian poet, mentioned by Horace, as one of the best authors in the department of the ancient Greek comedy.

OLYMPUS, in *Biography*. There were two great musicians in antiquity of the name of Olympus. The first was of Mysia, who is supposed to have been the inventor of the Orthian mode: others give it to the younger Olympus. This was the nome, according to Herodotus and Aulus Gellius, that Arion sung, when he precipitated himself into the sea. Plutarch says, that he was the chief and the master of beautiful and sublime music: he excelled in the tender and pathetic. Philostratus made him the subject of one of his pictures.

OLYMPUS, *Mysian*, lived before the Trojan war, and was the disciple of Marsyas. Plato, Aristophanes, Aristotle, and Ovid, cite his verses. Olympus the Phrygian lived in the time of Midas.

Aristoxenus relates that he composed, in the Lydian mode, the air for the flute which expressed the funeral sorrows for the death of Python. To him likewise are ascribed the Cerulean, Minervan, Harmatian, and Spondean modes. Plutarch, in his Dialogue on Music, informs us that Alexander, in his "History of the Musicians of Phrygia," pretends that Olympus was the first who introduced

duced the Greeks to the knowledge of stringed instruments; and that he instituted the custom of celebrating, with the flute, hymns to the polycephalic nome, in honour of the gods.

Plato says, that his music inflamed his auditors; Aristotle, that it exalted the soul; and Plutarch, that it surpassed in simplicity all other music. Plutarch also attributes to him the polycephalic nome, in honour of Apollo; though others ascribe it to Crates.

OLYMPUS, in *Ancient Geography*, a name given to several lofty mountains, and thence transferred to the heavens. Le Clerc derives it from "Holamimbo," *immortales in eo*; but the abbé Bergier deduces it from the oriental "Lop," or "Lup," signifying *elevation*. According to Hesychius, the number of these mountains was fourteen; and seven have been particularly noticed by geographers. Homer always distinguishes Olympus as the habitation of the gods, alluding occasionally to the mountain which separated Macedonia from Thessaly, and which was one of the mountains best known to the ancients, and described by European geographers under this name. As Athos (which see) astonished observers by its bulk, Olympus struck the beholder with a kind of reverence by its amazing elevation, and at the same time invited his ascent by the beauty and variety of the prospects which it afforded. The river Peneus, one of the clearest, gentlest, and most beautiful streams in the universe, washed its foot, dividing it from Ossa, and making a multitude of small, but delightful isles, covered with shady trees, and adorned with magnificent temples, grottos, porticos, and other stately buildings. On the south-east side of the hill ran the famous river Helicon, and near it stood a noble temple of Jupiter, in the midst of a shady grove. The mountains Ossa and Pelion were in the neighbourhood, and very considerable for their height, though they fell far short of Olympus. Sonnini has particularly described his ascent to the summit of this mountain. On the side of the mountain, and at the first stage of ascent, is the village called "Skala;" above which the acclivity, which was below it gentle, becomes rugged and steep. In this village is a Greek convent, from which the prospect is extensive and magnificent, commanding on one side the sea, the neighbouring coasts of mount Athos, and the numerous islands which diversify it; and on the other, the beautiful plains of Macedonia. The forest by which the monastery of Skala is surrounded is composed of pines, firs, oaks, elms, beeches, hollies, chestnut trees, &c. and inhabited by wild boars, stags, roe-bucks, bears, and birds of different species. The vicinity is exposed to the attacks and ravages of Albanian robbers; and Sonnini and his companions escaped, by feigning themselves to be foreign physicians, who were in search of plants on the mountain, that would furnish remedies for a variety of diseases. The aga or commander of the plundering band, labouring under a complaint, applied to them for relief; and thus they avoided the danger to which they were exposed. In ascending beyond Skala, our travellers stopped at another monastery, three leagues from the former: this bears the name of St. Dennis, to whom it is consecrated. Here the mountain is divided into several steep points, and the building is surrounded by those towering pinnacles, that are almost entirely composed of rocks. In this place are a grotto, or small chapel, said to have been built by St. Dennis himself; a hut which served him as a retreat; and at the extremity of the grotto, a spring issuing from a torrent in the rock, and which, as the fable says, the saint forced to appear by striking the rock with his cap. The small church of this convent is tolerably handsome; a large beautiful lustre of bronze,

made in Germany, is suspended to the roof. A small library of Greek and Latin books, printed in the same country, and well chosen, occupies a chamber of the monastery, and being little used, will long be preserved in good condition. Many other articles are brought hither from neighbouring civilized countries, and particularly a large clock, which, though of a common sort, is an object of admiration in all these districts. Above this insulated convent, situated in a very wild place, there are no more habitations on mount Olympus. Our travellers, as they advanced towards the summit, soon met with large heaps of snow; and here the guides waited their return, kindling a large fire, as the cold was very sharp at this height. Clambering amidst clumps of trees, and clinging to the branches of shrubs, which became scarcer as they got higher, and to the projections of rocks, they continued their ascent, till at length the mount became naked, and presented only a cap of snow and ice, on which it was impossible for them to be sustained or walk. "Is it not astonishing," says M. Sonnini, "that the Greeks have placed the abode of the gods on an eminence which mortals cannot reach?" At this time it was the middle of July: the heat was extreme towards the base of the mountain, as well as in the plain; and the masses of snow, which were condensed near its summit, did not appear to be on the point of melting. However it is said, that in the month of September no more snow is seen on Olympus; an assertion which our travellers did not credit, and which was contradicted by the testimony of the Greek monks, who have succeeded the gods on this great elevation of the globe, and who confirmed what will scarcely be doubted, the perpetual permanence of snow and ice on the top of the mountain. It is impossible, we are told, to conceive the immense extent of different countries which a view from the top of Olympus embraces: it seemed to touch Pelion and Ossa, which form another chain of mountains; and the vale of Tempé, which the ancient poets have described as a place of delight, appeared to be a very narrow gorge; and the river Peneus, which waters it, a streamlet of water scarcely perceptible. At the monastery of Skala, the temperature is mild, vegetation vigorous, and the number of animated beings greater than the frozen summit of Olympus afforded, with the exception of bouquets, native inhabitants of the rocks, and a few bears. There are hardly any quadrupeds to be seen beyond the half of the height of Olympus: scarcely do birds pass this limit. The other six mountains which bear the same name, are those of Thessaly, Mysia, Cilicia, the Elide, Arcadia, and the isle of Cyprus. See OLIMPO.

OLYMPUS, a promontory of the isle of Cyprus, before Carpathia, where was a temple of Venus *Acraea*; now called "Santa Croce."

The *Myrian* Olympus was a chain of mountains, commencing north of and near to the source of the Hermus, and extending from south to north, as far as Bithynia. It bears now the same name.

OLYMPUS, a town of Illyria.—Also, a town of Asia, in Pamphylia.—Also, a town of Asia Minor, in Lycia, near the sea, between Phafelis and the promontory of Hieron, which did not subsist in the time of Pliny; though Strabo describes it as a large city, one of the principal towns of Lycia, in the vicinity of a mountain of the same name.—Also, a mountain of the isle of Lesbos.—Also, a mountain of Lydia.—Also, a mountain of Lycia.—Also, a mountain of Asia, near Antandros, and joining mount Ida, &c. &c.

OLYNTIUS, a town of Thrace, in the Paraxia, at the bottom of the Toronæan gulf, between the peninsula of Pallene and Sinthonia. This town was possessed by the Greeks,

Greeks, originally from Chalcis of Eubœa. It arrived at a high point of prosperity and grandeur, and had frequent quarrels with Athens, Lacedæmon, and the kings of the latter state, particularly Philip, who destroyed it, so that it was never completely re-established. This destruction took place in the year 384 B.C.; and from an epigram of Antipater of Sidon, who lived about the year 146 before that era, it appears that it had a kind of renewal, by some power of which we have no certain account, nor do we know how long it lasted.

OLYRA, in *Botany*, a name borrowed by Linnæus for the present genus, and taken from the ancient *ολυρα* of Homer, Herodotus, and other Greek authors, amongst whom it was considered to be a fine sort of *corn* or *grain*, as we learn from the classical adjective *ολυγίτης*, (when joined with *εγκριθος*), signifying, *bread made of the finest flour*. Linn. Gen. 482. Schreb. 624. Willd. Sp. Pl. v. 4. 204. Swartz Obf. 346. Mart. Mill. Dict. v. 3. Ait. Hort. Kew. ed. 1. v. 3. 325. Juss. 33. Lamarck Dict. v. 4. 546. Illustr. t. 571. Loureir. Cochin. v. 2. 551.—Class and order, *Monoecia Triandria*. Nat. Ord. *Gramina*.

Gen. Ch. Male flowers beneath the female. *Cal.* Glume single-flowered, of two, equal, lanceolate valves; outer rather ventricose, terminating in a capillary, straight, smooth awn; inner narrower, acute, folded in on both sides. *Cor.* none. Nectary very small, of two, obovate, nearly emarginate, membranous, erect leaves. *Stam.* Filaments three, capillary, very short; anthers linear, acute at both ends. Female flowers solitary, terminal, in the same panicle, much larger than the males. *Cal.* Glume single-flowered, large, spreading, of two, nearly equal, ovate, concave, ribbed valves; outer terminating in a long, awl-shaped, somewhat waved awn, villose at the lower part; inner narrower, pointed. *Cor.* Glume of two unequal valves, much shorter than the calyx, coriaceous, shining, beardless, obtuse. Nectary very small, of three, obovate, membranous, erect leaves. *Pist.* Germen superior, oblong; style thread-shaped, cloven, almost as long as the calyx; stigma capillary downy. *Peric.* none, except the hardened glume of the corolla deciduous with the ovate, cartilaginous seed.

Eff. Ch. Male, Calyx-glume single-flowered, awned. Corolla none. Female, Calyx-glume single-flowered, spreading, ovate, awned. Glume of the corolla two-valved, beardless. Style cloven. Seed cartilaginous.

1. *O. paniculata*. Willd. n. 1. Swartz Obf. 347. (*O. latifolia*; Linn. Sp. Pl. 1379. Amœn. Acad. v. 5. 408. *Gramen panicum majus, spica simpliciter lævi, granis petiolis infidentibus*; Sloane Hist. Jam. v. 1. t. 64. f. 2.)—Stem branched. Panicle terminal.—Native of Jamaica in dry, shrubby places, flowering from January to June. *Roots* thread-shaped, long, rather thick. *Stem* erect, a fathom high, jointed, round, branched at the lower part; joints simple. *Leaves* sheathing, slightly stalked, broadish-lanceolate, pointed, horizontal, spreading, smooth, striated; sheaths downy. *Panicle* terminal, erect, spreading, many-flowered, its branches angular, rough, wavy.

2. *O. pauciflora*. Willd. n. 2. Swartz Prodr. 21. Ind. Occ. v. 1. 125. (*Gramen floribus axillaribus, foliis ovatis*; Loefl. It. Amer. 243.)—Flowers axillary.—Native of woods in Jamaica, where it flowers in the spring. *Roots* very long, capillary, rather hairy. *Stems* aggregate, about a foot high, spreading, nearly erect, simple, jointed, round, slender, smooth. *Leaves* sheathing, alternate, stalked, ovato-lanceolate, acute, slightly striated, downy, rough at the margin; sheaths a little hairy. *Flower-stalks* lateral

from the sheaths, thread-shaped, short, bearing both male and female flowers.

3. *O. orientalis*. Willd. n. 3. Loureir. Cochin. v. 2. 552.—Stem triangular. Spikes compound. Seeds triangular, rough.—Native of fields in Cochinchina. *Stem* about four feet high, erect. *Leaves* awl-shaped, long, partly embracing the stem. *Flowers* in compound spikes. *Seeds* triangular or roundish, white, large.

OLYSSA, in *Geography*, a town of the island of Crete. Strabo.

OLZIANY, a town of Lithuania; 30 miles S.S.E. of Wilna.

O'M, among *Hindoo Mystics*, is a monosyllable of very profound import. It is supposed to be a name or an emblem of the Deity, and so holy and awful, like the name Jehovah of the Jews, as not to be guiltlessly pronounced, even by a priest. It must be contemplated, or recited mentally; and it then is said to excite very efficacious aspirations. This awful monosyllable is trilateral, and perhaps therefore better written AUM, for three Sanscrit letters do in fact compose it: but in composition, to avoid cacophony, A and U coalesce in o. The first letter is supposed to be symbolical of Brahma, the creative power of the Deity; the second of Vishnu, the preserver; and the last of Siva, the destroyer or renovator: for Hindoo philosophers maintain that destruction is only reproduction in another form. (See SIVA and VISHNU.) As all the inferior deities of the Hindoos are avatars or manifestations of, and resolve themselves into those three superior powers, so those superior powers resolve themselves ultimately into Brahm, or the supreme being, of whom the sun is the most perfect and glorious murti, or image. (See MURTI.) A combination of the three symbolical letters forms, therefore, a hieroglyphical representation of the union of the three powers or attributes, and a word that, if uttered, would be nearly expressed by our letters AUM, or OOM, dwelling a little on each letter. A name of Parvati, the consort of Siva, is Uma, or Ooma, and it is perhaps hence derivable; as well as Omkar, one of the most sacred places of pilgrimage in India, dedicated to the worship of this mysterious union. See PARVATI.

In the Institutes of Menu (see MENU) many verses occur denoting the importance of this monosyllable, and of a text of the Veda closely connected with it, called the Gayatri; respecting which we shall in this article include also what we have to offer; together with some remarks on similar mysticisms observable in other people. Among those verses are the following:

Chap. ii. v. 74. "A Brahman beginning and ending a lecture on the Veda, must always pronounce to himself the syllable OM: for unless the syllable OM precede, his learning will slip away from him; and unless it follow, nothing will be long retained." A commentator on this verse says, "As the leaf of the *palasa* is supported by a single pedicle, so is this universe upheld by the syllable OM, a symbol of the supreme Brahm."

76. "Brahma milked out, as it were, from the three Vedas, the letter A, the letter U, and the letter M, which form by their coalition the trilateral monosyllable, together with three mysterious words, *bhur*, *bhuva*, and *sva*." These words mean earth, sky, and heaven, and are called the *vyahritis*.

77. "From the three Vedas, also, the Lord of creatures, incomprehensibly exalted, successively milked out the three measures of that ineffable text, beginning with the word *tad*, and entitled Savitri or Gayatri.

78. "A priest who shall know the Veda, and shall pronounce to himself, both morning and evening, that syllable, and

and that holy text preceded by the three words, shall attain the sanctity which the Veda confers.

79. "And a twice born man who shall a thousand times repeat those three, (OM, the vyahritis, and the gayatri), apart from the multitude, shall be released in a month even from a great offence, as a snake from his slough.

80. "The priest, the soldier, and the merchant, who shall neglect this mysterious text, and fail to perform in due season his peculiar acts of piety, shall meet with contempt among the virtuous.

81. "The great immutable words preceded by the trilateral syllable and followed by the gayatri, which consists of three measures, must be considered as the mouth or principal part of the Veda.

82. "Whoever shall repeat, day by day, for three years, without negligence, that sacred text, shall hereafter approach the divine essence, move freely as air, and assume an ethereal form.

83. "The trilateral monosyllable is an emblem of the Supreme, the suppression of the breath with a mind fixed on God are the highest devotion; but nothing is more exalted than the gayatri."

The suppression of the breath is thus performed by the priest: closing the left nostril with the two longest fingers of the right hand, he draws his breath through the right nostril; then closing that nostril likewise with his thumb, holds his breath while he meditates the text: he then raises both fingers off the left nostril, and emits the suppressed breath, having, during its suppression, repeated to himself the gayatri, the vyahritis, the trilateral monosyllable, and the sacred text of Brahm. By an ancient legislator it is said to imply the following meditation: "OM! earth! sky! heaven! mansion of the blessed! abode of truth! —We meditate on the adorable light of the resplendent Generator which governs our intellects: which is water, lustre, favour, immortal, faculty of thought, Brahm, earth, sky, heaven." The words which we have distinguished by italics are very nearly the gayatri.

Chap vi. v. 70. "Even three suppressions of breath, made according to the divine rule, accompanied by the triverbal phrase (*bhurbhuvassvabh*), and the trilateral syllable (OM), may be considered as the highest devotion of a Brahman.

71. "For as the dross and impurities of metallic ores are consumed by fire, thus are the sinful acts of the human organ consumed by the suppression of breath, while the mytic words and the measures of the Gayatri are revolved in the mind."

This may suffice to shew the veneration in which this "mytic monosyllable" and "ineffable text" are held by Brahmans and Hindoos in general, on the authority of their most revered legislator Menu. Others of their most sacred books confirm them in this veneration. In the Gita, Krishna, describing his own excellencies, selects the first and best of many things wherewith to compare himself. "I am," he says to Arjun, "the monosyllable among words." "Amongst harmonious measures I am the Gayatri." See KRISHNA AND SRI BHAGAVAT.

The extreme importance that the Hindoos attach to the gayatri, renders it a text of more curiosity than perhaps a general reader will be able to discover in the words themselves, in either their familiar or recondite meaning. It is, like the holy monosyllable, to be mentally revolved, never articulated. It is taught, as we have seen in the preceding extracts from Menu, to the three first classes, that is, to the Brahman or priesthood, to the Kshetriya or soldier, and to the Vaishya or merchant; but not to the Sudra or labourer, nor to individuals of the three first-named classes, if rendered

by vicious propensities unworthy of the "second birth," promised in the holiness of this mysterious regeneration. Fasting, ablution, prayer, almsgiving, and other commendable acts, are necessary preliminaries and accompaniments to initiation in the mysteries of this "ineffable text," which is done by the Guru, or spiritual preceptor, in a reverent and secret manner. In the Vedas the text occurs several times, and translations of it by different Sanscrit scholars are given, with many particulars of it and other mysterious points, in the Hindoo Pantheon. "There is no doubt," says the author of that work, "but that pious Brahmans would be very deeply shocked at hearing the gayatri defiled by unholy articulation, even if expressed in the most respectful manner; and many would be distressed at knowing the characters, sound, and meaning, to be in the possession of persons out of the pale of sanctity. A gentleman on the western side of India, unaware of the result, began once to recite it audibly in the presence of a pious Pandit: the astonished priest stopped his ears, and hastened terrified from his presence. I should be sorry, for my own part, if it were revealed so as to incur the liability of utterance by inconsiderate individuals, who might thereby wound the feelings of many good and respectable men; its promulgation, while probably distressing to many, would answer no desirable end to science or literature." Page 410. In the frontispiece to that work, the character or symbol is given that would, if uttered, yield the sound of OM. The author says he once shewed it to a Brahman, who silently averted his face, evidently pained by what he unwillingly saw.

It has been doubted if any except Brahmans were initiated in the supposed mysteries of this holiest text. From the extracts given above from the Institutes of Menu, it is clear that the gayatri, so far as regarded the words of the text, was taught, with certain exceptions, to three out of the four classes or tribes of Hindoos. How far any but Brahmans are initiated in its supposed mysteries, is another question, and not perhaps easily solved. But it may be here proper to remark, there is a plurality of gayatris, although their differences have not been hitherto developed. "The white goddess, or Saraswati, presides over arts and sciences: she is the Vedas, and the Vedas are in her. (See SARASWATI). Savitri, the consort of Brahma, is the gayatri, emphatically called the mother of the Vedas. The gayatri consists of certain mysterious words, which are considered as the quintessence of the Vedas. The three superior classes are regenerated, or born again, as they say of the gayatri; in the same manner that we are born again of the spirit and water: and the mysterious name of the holy Trinity is really our gayatri. From this regeneration Brahmans are called Dwija, or twice born. The necessity of regeneration is a fundamental tenet among divines in the east as well as in the west. There are five different gayatris, according to the number of the principal deities, which are Vishnu, Siva, the Sun, Devi, and Ganesh. That of the sun is the first, and belongs exclusively to the sacerdotal class." Af. Ref. vol. xi. art. 2.

Hence it may be reasonably inferred that there are different degrees of initiation in the free masonry of the gayatri. That of Surya, or the sun, with its esoteric allusions and meanings, is apparently taught to priests only. The powers of creation, preservation, and renovation, united and symbolized in the mytic OM, appear by the effects produced to exist in a peculiar degree in the sun, and to this object adoration seems to have been paid by all people of whom any remote record hath reached us. (See IDOLATRY.) But the Brahmans deny such adoration: affirming that it is to the "incomparably greater Light," typified by the sun—that

that their devotions are directed. This indeed the commentaries on the gayatri uniformly confirm. See SURYA.

Sir W. Jones says that the gayatri is called the "Mother of the Vedas." This we apprehend is to be taken inductively; the Vedas proceeded from Brahma, or from his fakti or coequal power or consort Saraswati, who is named Savitri, as is also both the gayatri and the sun. In the conclusion of the preface to the Institutes of Menu, is a translation, the words in Italics being those immediately of the text. "The many panegyrics on the gayatri, the mother, as it is called, of the Vedas, prove the author (Menu) to have adored, not the visible material sun, but that *divine and incomparably greater light, which illumines all, delights all, from which all proceed, to which all must return, and which alone can irradiate* (not our visual organs merely, but our souls and) *our intellects*. These may be considered as the words of the most venerable text in the Indian scripture."

Another translation occurs in the last volume of his works, in which he seems to have intended making the translation as literal as possible.

"The gayatri, or holiest verse of the Vedas: Let us adore the supremacy of that divine sun, the godhead, who illumines all, who recreates all, from whom all proceed, to whom all must return; whom we invoke to direct our understanding aright in our progress toward his holy feat."

The following paraphrase or commentary, is by a learned Brahman named Rhadakant, of whom honourable mention is often made by his illustrious pupil, the early loss of whom all lovers of virtue and learning, of oriental learning and literature especially, unite in deploring. "Perfect truth; perfect happiness; without equal; immortal; absolute unity; whom neither speech can describe, nor mind comprehend; all pervading; all transcending; delighted with his own boundless intelligence, not limited by space or time; without feet, moving swiftly; without hands, grasping all worlds; without eyes, all-surveying; without ears, all-hearing; without an intelligent guide, understanding all; without cause, the first of all causes; all-ruling; all-powerful; the creator, preserver, transformer, of all things.—Such is the great one: this the Vedas declare." The reader may be amused and edified by comparing this Brahmanical description of the Deity, with that of sir Isaac Newton, given under the article God of this work.

We are induced to give another translation of this revered text, together with the prayer which contains it, and that which precedes it, by Mr. Colebrooke, the learned president of the Asiatic Society. It occurs in the last hymn of the third book of the first, or Sama, Veda. This appears to be its proper and original place; for although it occurs also in other Vedas, yet here it is included with invocations by Viswamitra, the sage or Rishi to whom it was revealed. (See RISHI and VISWAMITRA.) "This new and excellent praise of thee, O splendid playful Sun! is offered by us to thee. Be gratified by this my speech; approach this craving mind, as a fond man seeks a woman. May that Sun who contemplates, and looks into, all worlds, be our protector.

"*Let us meditate on the adorable light of the divine ruler—(Savitri).—May it guide our intellects.* Desirous of food, we solicit the gift of the splendid sun (Savitri) who should be studiously worshipped. Venerable men guided by the understanding, salute the divine sun (Savitri) with oblations and praise."

The passages which we have distinguished by italics appear to contain the whole of the gayatri; and with their context are sufficient to prove that the Hindoos, esoterically, are not polytheists. But it is not easy to discover why the text

should be fancied so very profound, or why it should be kept secret; for its exposition, unconnected with the idea of mystery, does not seem likely to have the effect, so dreaded by priests, of "guiding the intellects" of the multitude to the discovery of truth.

We have thus offered, under one article, what we wished to say on those two mysterious words *Om* and *Gayatri*. However puerile such mysticisms may appear to a certain class of philosophers, it cannot be otherwise than interesting to those inquisitive as to the varieties and coincidences in the human mind, to trace them among remote people and back to remote ages. What is received with mysterious awe by millions of intelligent beings, cannot be wholly undeserving the scrutiny of philosophy; and where the wisest of refined people distant from, and unconnected with, each other, agree in such visionary reveries, as we may, if we please, call them, the result of an enquiry into their origin and diffusion may perhaps repay the trouble of research. We shall, in this place, however, merely throw out a hint to invite attention on the part of those who have more time and inclination to devote to such points, than we profess to have.

As in all languages the letter equivalent to A is the initial, or first of the alphabet, so, with most lettered nations, it has been supposed to signify things primary. Among ancient writers, alpha or aleph was used to denote the chief or first man of his class or rank. By some it was applied to Moses; by many to something mysterious or divine; thence to the Deity. In the sacred writings we find the Lord saying, "I am *alpha* and *omega*, the beginning and the end, the first and the last." These two letters were hence formed, by mystical researches, into a sort of hieroglyphic, or symbol of the Deity, and afterwards of Christianity, and as such was engraved on the tombs of the early Christians, to distinguish them from those of idolaters. Thus we find the Hindoo sacred writings put the same words into the mouth of *Krishna*, as cited under that article. "I am," he says to Arjun, "of things transient, the beginning, the middle, and the end." "I am the monosyllable among words." This monosyllable *om* is the combined alpha and omega of the Brahmas. Without laying any stress on it, it may be observed in passing, that those initial and final letters would, combined, yield nearly the monosyllable found in question. Initial and final letters have thus, by position, become mysterious with many people. In Sanscrit the word *agam* contains the important letters, and the word accordingly is found to mean *secret, hidden, mysterious*. The Hindoos have an occult work, entitled *Agama Sashtra*, or *Mysterious Ordinances*. The same work *agam*, or *ogham*, has the same meaning, we are told by general Vallancey, in the Irish tongue; and in the 14th vol. of the *Archæologia*, are some learned observations by the Rev. Stephen Weston, on the *Ogmian* Hercules of Lucian, in which the identity of the Sanscrit and Irish words, and their connection with the obscure God, is maintained.

The similarity of the languages of the Arabians and Hebrews, and the common origin of the law of those people, lead us to expect a like similarity in their notions, as to the mysterious import of certain letters. Such notions were, and are, of extensive prevalence among them. We have already shewn the mysticisms of the Hindoos touching first and last letters, their "triliteral monosyllable," their "triverbal phrase," &c. trinities. With the Arabs and Jews the alphabetic initial is the initial and final, the first and the last, like the alpha and omega of the Greeks, of one their names of God, and is regarded as of peculiar sanctity. It has occurred to us that the mysterious passage in Exodus, אֶהְיֶה אֲשֶׁר אֶהְיֶה, bath derived some of its mystic import

port from the common propensity of mankind to see something profound in the form and position of letters. Number has, of course, as well as form and position, a like allusion; and, of all numbers, *three* and *one* bear the palm of mysticism with a curious variety of people. Thus the initial aleph and alpha denoting one, denoted also, like the single jod of the Hebrews, and the dot or point of the Hindoos, the unity of the Supreme. Three in combination were very mystical, either as finals or initials; nor was a medial position wholly unimportant. The *psi*, *shin*, exhibiting three jods comprehended in one, was not held to be unmeaning or indifferent. The trident of the western Neptune, and the trifida of the eastern Siva, have been supposed to be connected with the allusions of this typical letter. This triune emblem denotes dominion over earth, sky, heaven, the tri-verbal *bburbhuwafwah*, the "great immutable words," as we have seen, of Menu, the Hindoo lawgiver.

Without prying farther into these fancied mysteries, let us look, for a moment, at the above obscure text in Exodus, uttered, under awful circumstances, by the Deity, in unity of person. In our version it is rendered "I AM that I AM," Ex. iii. 14. The emphatic words are usually printed in capitals. Passing by the meaning of the text, we see, in the original, composed of a triverbal phrase of trilateral monosyllables, each of the three words beginning with a mystic initial of unity, the mystical letter of triunity being precisely medial. In other words, one important letter typical of triunity, medially comprehended in one awful triverbal phrase, composed of trilateral monosyllables all beginning with the thrice-recurring initial of unity.

Here then, in this Jewish gayatri, we find the trilateral monosyllabic-triverbal text, so much admired by the Hindoos, and combining all the literal trinitities, initial, medial, and final, in every mystical variety of number, position, form, obscurity, &c. that the most enthusiastic, in the prurieny of his imagination, can desire. We might farther notice the awful letter *י*, the initial and final, "the alpha and omega, the first and the last" of Jehovah, tremendous name! that, like the *om* of the Hindoo, no Hebrew would utter, as the final of the *first* and *last* words of the above "ineffable text," also the position, &c. of the phrase "I am alpha and omega, the beginning and the end, the first and the last," in our scripture. It occurs *three* times, and in the *first* and *last* chapters of the revelation of St. John. But on these, and many other similar, and probably, accidental points, that might be hence mystically "milked out as it were," we have, perhaps, said enough to shew why these triverbal, &c. phrases, should have been deemed so mysterious by enthusiastic individuals, prone to regard every thing obscure as mysterious, and every thing mysterious as profound.

It may be doubted if the received translation of the important text in Exodus, iii. 14. be the best that could have been adopted. The Hebrew having no present tense; "I am," conjugatively, seems unauthorized by the original. Any literal translation into English would perhaps be equally liable to objection. "I will be what I have been," to wit, a father, a protector, a God, unto them, has been paraphrastically suggested. The conclusion of the verse, however, appears to imply that *יְהוָה* was not meant as any part of the conjugation of a verb. "Thus shalt thou say unto the children of Israel, I AM hath sent me unto you." The important word in the English version occurs again in capitals. In this sense of a sacred cognomen many divines have received it. "The Eternal Almighty I AM hath sent me," was an expression of Whitefield, the enthusiastic itinerant preacher, (Gillies' Life of Whitefield,) and shews that he,

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among others, received it in this light. Josephus expressly says that it was not lawful to speak of the name by which God revealed himself to Moses. (See ADONAI). This was believed to have been Jehovah, for which the ancient Jews had a profound veneration; and soon after the Babylonish captivity it ceased to be uttered, its true pronunciation being supposed to be lost or unknown. When the sacred books were read in the synagogues, the reader, whenever this sacred name occurred, did not attempt to pronounce it, but substituted for Jehovah the other word, which answers to the English word Lord. (See Horfeley's Sermons, vol. iii.) It was respectfully alluded to as the Name, the Ineffable Name, the Name of four letters: and in the Talmud curses are denounced against those who should utter it. To try, even, was sinful. (See JEHOVAH.) This we see is in unison with the Hindoo prejudices in regard to the unutterable *om*, which they pre-eminently call the monosyllable, the gayatri, the ineffable text, &c.

OM, in *Geography*, a river of Russia, which is of a clear, but black looking water, that runs into the Irtisch, at Omsk.

OM el Misk, a small island in the Red sea, near the coast of Arabia. N. lat. $22^{\circ} 35'$.

OMA, one of the Molucca islands, about 9 miles long and 6 wide, containing 11 villages, the principal of which bears the same name, and about 5000 inhabitants.

OMACHIS, a river of Canada, which runs into lake St. Pierre. N. lat. $46^{\circ} 16'$. W. long. $72^{\circ} 42'$.

OMAGH, a post-town of the county of Tyrone, Ireland, where the assizes are held. It is situated on the river Cameron, and is nearly in the centre of the county. It was formerly the seat of an abbey. It is $86\frac{3}{4}$ miles N.N.W. from Dublin.

OMAGRA, a name given by some medical writers to the gout, when seated in the articulation of the humerus with the scapula.

OMAGUACA, in *Geography*, a town of South America, in the province of Tucuman; 50 miles N. of St. Salvador de Jugui.

OMAGUAS, a tribe of Indians, inhabiting the banks of the river Amazon, and converted to Christianity in the year 1686, by father Fritz, a Spanish missionary. They flatten the hinder and fore part of the heads of their children, and thus give them a monstrous appearance. They treat the people of other nations with ridicule, calling them calabash heads.

OMAGUAS, a town at the confluence of the Marañon and Tunguraga, otherwise called *St. Joachim*; which see.

OMAN, a town of Arabia, capital of a province of the same name; 60 miles N.W. of Mascat. N. lat. 24° . E. long. $57^{\circ} 20'$.

OMAN, a province of Arabia, bounded on the E. by the ocean, on the N. by the Persian gulf, and on the W. and S. by extensive deserts. It is possessed by a number of petty sovereigns, the most considerable of whom is the Imam of Oman, or Mascat. Several of these sovereigns bear the title of scheich. The whole western side of Oman is a sandy plain, a day's journey in length, and extending from the village of Sib to the town of Sohar. The Imam's territories are mountainous to the brink of the shore. All the rivers continue to flow throughout the year, except that near which Sohar stands; which, traversing an arid plain, loses itself among the sands, and reaches the sea only in the rainy season. The country affords plenty of cheese, barley, lentils, and different sorts of grapes. Dates are so abundant, that several ship-loads of them are annually exported; and there is a variety of other fruits, and of pulp.

Here are also lead and copper mines. Fishes are so plentiful upon the coast, and so easily caught, as to be used not only for feeding cows, asses, and other domestic animals, but even as manure to the fields. The inhabitants are of different sects in religion, and mutually regard one another as heretics. The subjects of the Imam follow one Mussulman doctor, and those of the Scheichs another. The territory possessed by the Imam of Oman is pretty extensive, and contains several towns, such as Rostak, Kalbat, Kiloa, and Sinsjibar; but the most important and best known city in the dominions of this Imam is *Mascat*, which see. To eke out his scanty revenue, the Imam does not himself disdain to deal in trade. He keeps four ships of war, and a number of small vessels, which, in time of peace, he employs in the conveyance of goods, chiefly to and from the eastern coast of Africa, where he still possesses Kiloa and Sinsjibar. Some other ships are kept to guard the coast, which is done so negligently or timidly, that pirates venture even into the road of *Mascat*. The inhabitants of Oman, although not fond of sea-fights, are nevertheless the best mariners in all Arabia. They have several good harbours, and employ many small vessels in the navigation between Jidda and Basra. To the last town they send annually fifty vessels, called "Trænkis," which are sewed together without nails, the planks being bound with cords. Two numerous tribes of Arabs are chiefly employed in carrying coffee by sea. One of these tribes once inhabited the shores of the Persian gulf; but being harassed by turbulent neighbours, they at length sought refuge in the dominions of the Imam of Oman. Niebuhr.

OMAR I., in *Biography*, the second of the caliphs or successors of Mahomet, was distinguished, while in a private station, for his love of justice, and his zeal for the prophet's authority, of which the following instance has been given, though it surely deserves a very different character: a Mussulman, having a dispute with a Jew, which was decided against him by the prophet, appealed from him to Omar, then in high authority, and held in great respect for his integrity and piety. Omar having heard the grounds of the dispute, desired the parties to wait a short time, and withdrawing to his house, returned with a scymitar, and instantly clove down the Mussulman with his weapon, exclaiming, "This is the reward of him who refuses to submit to the judgment of God and his prophet." It was on this account that Mahomet gave him the appellation of al-farouk, signifying both the divider and the distinguisher, thus doubly alluding to his action, and the discernment that prompted it. On the death of Abubeker, in 634, he succeeded to the office of caliph, and he obtained at the same time the title of "Commander of the Faithful," which became that of the succeeding caliphs. One of the first acts of Omar was to supersede the ferocious but successful Caled in the command of the army in Syria; and he restored it to Abu Obeidah. (See CALED.) Omar, like his predecessor, was the friend to peace, and employed himself at home in the civil and religious functions of his office; but his reign was the era of some of the greatest accessions made to the Arabian empire, by the conquests of its several chiefs. In Syria, after the capture of Damascus, the Moslem army proceeded to the reduction of Balbec, or Heliopolis, and Emessa. The emperor Heraclius having sent a great force to stop the progress of the Arabs, it was defeated by Caled in the year 636, at the bloody battle of Yermook. The siege of Jerusalem was the immediate consequence of this victory. It was bravely defended, but the besieged having no prospect of success, entered upon a treaty of capitulation. One of the articles agreed upon was, that in consideration of the dignity of this

holy city, the object of veneration to Mahometans, as well as to Christians and Jews, the caliph should come and take possession of it in person. Omar agreed to the proposal, and his journey has been thus described: mounted upon a sorrel-coloured camel, in a tattered habit of hair-cloth, he carried with him his provision in two bags, consisting of sodden grain and fruits, together with a leathern sack filled with water, and a wooden dish. When he halted to make a repast, he permitted any of his slender train to partake with him, eating from the same dish. He performed with great devoutness all the offices of his religion, and during his march administered justice to all applicants. In several instances, he corrected the laxity of morals which was prevalent among the new converts, especially in matrimonial cases. On approaching Jerusalem he was met by Abu Obeidah with an escort, and conducted with great reverence into the camp. He there publicly preached to the troops, and rigorously abolished many luxurious indulgencies which had gained ground among them. He then signed the capitulation, by which the Christian inhabitants of Jerusalem were secured in their lives, properties, and the free exercise of their religious ceremonies, but at the same time were made tributary, and subjected to various humiliating restrictions. Omar then made his entry into the city, and visited the places most remarkable for religious antiquities, in company with the patriarch, with whom he conversed most freely. Expressing a desire to perform his devotions, the patriarch spread a mat for him in the church of St. Constantine, but the caliph declined taking advantage of this instance of civility, and, instead of worshipping in the church, knelt down on one of the steps leading to the east door, in order that he might secure to Christians the use of their sacred house, well knowing that if he, the caliph, had prayed in it, the Moslems would ever after have claimed the same privilege. He made choice of the site of Solomon's temple for the foundation of a Mahometan mosque, the only one erected by him in Jerusalem. The conversion of a Jew by his arguments was a circumstance which he said gave him as much pleasure as the conquest of the holy city. Having regulated the government of Syria, and directed Amru to undertake the reduction of Egypt, the caliph returned to Medina. Aleppo and Antioch were next reduced by the Moslems, who made themselves masters of Palestine, and of several places near the Euphrates. Said, one of the commanders, crossed the river Tigris, and sacked the city of Madayn, the ancient Ctesiphon. Syria was at length completely subdued, and Amru, now principal commander, proceeded to Egypt, and completed the conquest of that country by the reduction of the great and rich commercial city of Alexandria. (See AMRU.) This event, says the historian, gave occasion to one of the most remarkable incidents connected with the name of Omar. Upon an application from Amru to the caliph to know his pleasure concerning the famous Alexandrian library, an answer was returned, commanding its destruction; "for," said the caliph, "if the books agreed with the book of God (the Koran), they were superfluous; if they disagreed, they were pernicious, and ought to be destroyed." In consequence of this horrible decision, the manuscripts were delivered to the five thousand public baths in the city, to which they served as fuel during the space of six months. (See ALEXANDRIAN Library.) Under the reign of Omar, Mesopotamia, part of Persia, Khorasan, and other remote oriental regions, were reduced to obedience to the Mahometan sceptre. The days of this caliph were, however, cut short by violence, for in the eleventh year of his reign he received a stroke from the dagger of a Persian slave, exasperated by a decision against him respecting his tribute, which, in the space of three days,

days, brought him to his tomb, at the age of sixty-three. He refused to nominate a successor, but appointed six electors to fill the vacant throne. Omar was deeply and deservedly regretted by the people. His character is thus drawn by Gibbon: speaking of the virtues of his predecessor, he says, "yet the abstinence and humility of Omar were not inferior to the virtues of Abubeker; his food consisted of barley-bread or dates; his drink was water; he preached in a gown that was in rags; and a Persian satrap, who paid his homage to the conqueror, found him asleep among the beggars on the steps of the mosque of Medina. Economy is the source of liberality, and the increase of the revenue enabled Omar to establish a just and perpetual reward for past and present services to the faithful. Careless of his own emolument, he assigned to Abbas, the uncle of the prophet, the first and most ample allowance of twenty-five thousand drachms or pieces of silver. Five thousand were allotted to each of the aged warriors, the relics of the field of Beder, and the last and meanest of the companions of Mahomet was distinguished by the annual reward of three thousand pieces. One thousand was the stipend of the veterans who had fought in the first battles against the Greeks and Persians, and the decreasing pay, as low as fifty pieces of silver, was adapted to the respective merit and seniority of the soldiers of Omar. Under his reign, and that of his predecessor, the conquerors of the East were the trusty servants of God and the people: the mass of the public treasure was consecrated to the expences of peace and war; a prudent mixture of justice and bounty, maintained the discipline of the Saracens, and they united, by a rare felicity, the dispatch and the execution of despotism, with the equal and frugal maxims of a republican government." Univer. Hist. Gibbon.

OMAR II., the 13th caliph of the race of the Omniades, succeeded his cousin, Solymán, in the year 717. He laid siege to Constantinople, but was forced to raise it, on account of a violent storm, which destroyed a great part of his fleet. He was poisoned at Emessa, in Syria, in the year 720. He is characterised as having been extremely just, religious, and devout, and as one who had fixed his mind, from his infancy, entirely upon another world. He had been extremely economical; but his liberality exhausted all his revenues, and at his death he had nothing to leave to his successors. Univer. Hist.

OMARA, in *Geography*, a river on the coast of Brazil, which runs into the Atlantic, and whose mouth is in S. lat. 5°, and W. long. 36°.

OMARK, a town of Norway; 38 miles N.E. of Frederickstad.

OMASUYOS, a jurisdiction of South America, in the government of Buenos Ayres, on the banks of the lake Titicaca. The climate is cold, so that it produces little grain, but its pastures feed a great number of cattle, and it has four gold mines. It has also the advantage of a brisk trade, carried on in another jurisdiction by the Indians living on the borders of the lake, who are active and industrious in the prosecution of it.

OMBA, a small island in the Adriatic, near the coast of European Turkey. N. lat. 43° 5'. E. long. 18° 9'.

OMBAY, an island in the East Indian sea, about 60 miles in length from E. to W., and 18 in breadth. S. lat. 7° 58'. E. long. 125° 7'.

OMBERGAUM, a town of Hindoostan; 25 miles W. of Poonah.

OMBLA, a river of Dalmatia, which runs into the Adriatic, a little N. of Ragusa, forming at its mouth a considerable gulf.

OMBO, a town of Egypt, on the E. coast of the Nile; 26 miles N. of Syene.

OMBRE, a celebrated game at cards; played by two, by three, or by five persons; but generally by three.

The game of ombre is borrowed from the Spaniards, and requires all the phlegm and gravity of that people in the playing.

The name signifies as much as the *game of man*; *ombre*, or *hombre*, in Spanish, signifying *man*, in allusion to the thought and attention required in it.

In ombre *by three*, nine cards are dealt to each party; the whole ombre pack being only 40, by reason the eights, nines, and tens are thrown aside: he that wins must take five tricks, or four when the other five are divided, so as one have two and the other three.

After the cards are dealt, if none of the parties think their hand strong enough to attempt for the stake or game, they all *pass*; and after something put down to the former stake, deal over again. If any will attempt for it, he henceforth is called the *ombre*; and the other two become leagued together, like two partners at whist, to defend it against him.

Note, each has the refusal of being ombre, according to his order of seniority.

There are two ways of undertaking for the game: in the first, which is most usual, after choosing what he will have trumps, he discards, or lays aside, what number of his cards he pleases, and in their lieu takes an equal number from the remainder of the pack: the like do the other two. The other way is, when he dare trust to his own hand, and therefore declines to discard, or change any cards, but leaves that to the others, which is called playing *sans prendre*: if he gains the point, in this latter case, he reaps somewhat extraordinary, more than in the first.

If he fail in either case, he is said to be *beasted*: and the failure is called a *remise*, or *repuesse*; and if one of the defenders of the stake win more tricks than he, such person is said to win *codille*, and takes up the stake the ombre played for: and in both cases, the ombre is to forfeit the value of the stake played for to the board.

If the ombre win all the nine tricks, it is called winning the *vole*, and he reaps double; and if he attempt it, and miscarry, he suffers proportionably.

The oversights and irregularities committed in the course of the game, are called *beasts*, and subject the persons chargeable therewith to forfeitures.

As to the order and value of the cards at ombre, it is to be observed, that the ace of spades, called *spadille*, is always the first or highest trump, in whatever suit the trump be: the deuce of trumps, when trumps are either of the black colours, or the seven, if of the red, is the second trump, and called *manille*; the ace of clubs, called *basto*, the third; and if either of the red suits be trump, the ace of that suit, called *punto*, the fourth. The rest in the black suits are valued according to the following order; viz. king, queen, knave, seven, six, five, four, and three. In the red suits, they follow thus; king, queen, knave, deuce, three, four, five, and six.

The three first, or principal trumps, are called *matadores*; which have this privilege, that they are not obliged to attend an inferior trump when it leads; but for want of another small trump, the person may renounce trumps, and play any other card. Add, that if the three *matadores* be in the hands of the ombre, in case he be *beasted*, he is to forfeit for them; or if he gain his point, he is to have a consideration for them; but for nothing less than three. And it must be farther noted, that the trumps immediately succeeding

ing these; viz. punto, king, queen, &c. if they be found in the same hand with the former, are also reputed as matedores, and to be allowed, or forfeited for, like the rest; and this as low as the sequence reaches, without interruption.

There are some varieties in the manner of playing the game of ombre. Sometimes he who has spadille is obliged to play, let his game be ever so bad; which is called *forced spadille*: sometimes, when all have passed, a person undertakes the game on condition of discarding or making up his hand, before he names trump; which is called the *gascarille*.

In ombre *by five*, which some even prefer to that by *three*, as not requiring so much attention, only eight cards a-piece are dealt: and five tricks must be won, otherwise the ombre is beaten.

Here the person who undertakes the game, after naming the trump, calls a king to his assistance; upon which, the person in whose hand the king is, without discovering himself, is to assist him as a partner, and to share his fate. If between both they can make five tricks, the ombre wins; and then the auxiliary king shares the spoil; and *vice versa*.

If the ombre *venture* the game without calling in any king, this too is called playing *sans prendre*; in which case the other four are all against him, and he must win five tricks alone, or be *beasted*. The rest is much the same as by *three*, *mutatis mutandis*.

OMBRE *de Soleil*, in *Heraldry*, *shadow of the sun*, is when the sun is borne in armoury, so as that the eyes, nose, and mouth, which at other times are represented, do not appear; and the colouring is thin, so that the field may be seen through it.

OMBRIA. See BRONTIA and CERAUNIA.

OMBROMETOR, a machine to measure the quantity of rain that falls. We have the description and figure of one in Phil. Trans. N° 473. p. 12. It consists of a tin funnel, whose surface is an inch square, a flat board, and a glass tube set into the middle of it in a groove. The rise of the water in the tube, whose capacity, at different times, must be measured, and marked, shews the quantity of rain that has fallen. See RAIN-gage.

OMBRONE, in *Geography*, a river of Etruria, which runs into the Mediterranean, 5 miles S. of Grossetto. N. lat. 43° 47'.—Also, a town of Etruria, in the territory of Sienna; at the mouth of the Ombrone.—Also, a river of Etruria, which runs into the Arno, 8 miles below Florence.

OMDARRA, a town of Bengal; 27 miles E.S.E. of Nagore.

OMDINAR, a town of Egypt, at the separation of the two great branches of the Nile; 7 miles N.N.W. of Cairo. N. lat. 30° 6'. E. long. 49° 3'.

OMEDUNDA, a town of Bengal; 34 miles N.N.E. of Doefa.

OMEGNA, a town of Italy, in the department of the Gogna; 25 miles N.N.W. of Navarre.

OMELET, or AMLET, a kind of pancake, or fricassée of eggs, with other ingredients, very usual in Spain and France.

Menage derives the word from the Italian *animella*, *little soul*; which, he says, the people use for the nice bits among the giblets of fowls, &c. used for fricassées, as livers, hearts, kidneys, gizzards, &c. From whence, by resemblance, is formed the French *amelette*, a *fricassée of eggs*. Tripod derives the word from *αμα*, *together*, and *λυσιν*, *to dissolve*, *moisten*, *mix*. And M. de la Mothe le Vayer, from the French *auf*, *egg*, and *melez*, *mingled*.

The forms of omelets are various. We meet with farced

omelets, omelets with fugar, omelets of green peas, omelets *à la Turq*, &c.

A noted author in this way prescribes the following one: the eggs being beaten, are to be seasoned with salt and pepper, and then fried in butter made boiling hot: this done, gravy is to be poured on, and the whole strewed with chives and parsley, shred small. When one side is fried enough, it is to be turned on the other.

OMELLOOR, in *Geography*, a town of Hindoostan, in Travancore; 6 miles N. of Anjenga.

OMELOVAIA, a town of Russia, in the government of Ekaterinoflav, on the Dnieper; 60 miles N.E. of Cherfon.

OMELYSIS, a word used by Hippocrates, and others of the ancients, to express the meal of barley, crude or not parched. It is recommended, when reduced to the form of a poultice, by boiling in wine and oil, for curing all tumours of the tonsils. It is also recommended, mixed in water, to be drank in hæmorrhages of the uterus. Authors of later date have made the word omelysis stand for all sorts of meal or flour, and some for an equal mixture of the meal of barley, linseed, and senugreek seed, in equal quantities; in medicine used for horses. And Cælius Aurelianus uses it frequently for a cataplasm made either of meal, or bread, and water.

OMEN. The primitive and literal signification of this word seems to be, a sign of future events from the language of a person speaking, without any intention to prophecy: this meaning of the word is implied in the well-known passage of Cicero: "Pythagorei, non solum voces deorum observarunt, sed etiam hominum quæ vocant *omina*."

The application and meaning of this term was, however, soon extended; and in its secondary sense comprehended and supposed signs of future events, or presages, drawn from things, as well as from the words of men. The third sense, in which it is used by ancient writers, is still more comprehensive as well as common: in this sense, it includes the whole mystery and practice of augury, as it was pursued on a regular system by the Greeks and Romans.

The word omen, in all these three senses, is applied to signs of future events, drawn from circumstances neither supernatural, nor very extraordinary or uncommon. The same principle of the human mind, however, which has led rude or superstitious and unenlightened men to infer future events from natural and common circumstances, operated with much more effect, in creating the belief, that supernatural and extraordinary events were the presages of what was to happen. Hence the word omen, in its most extended sense, signified any portent or prodigy.

The law and process of the human mind, by which the belief of omens is generated, is explained in a most clear, satisfactory, and philosophical manner, in the following passage of professor Stewart, in his *Elements of the Philosophy of the Human Mind*, p. 346, quarto edition.

"This tendency of the mind to associate together events, which have been presented to it nearly at the same time; although, on the whole, it is attended with infinite advantages, yet, like many other principles of our nature, may occasionally be a source of inconvenience, unless we avail ourselves of our reason and of our experience in keeping it under proper regulations. Among the various phenomena, which are continually passing before us, there is a great proportion, whose vicinity in time does not indicate a constancy of conjunction; and unless we be careful to make the distinction between these two classes of connections, the order of our ideas will be apt to correspond with the one as well as with the other; and our unenlightened

lightened experience of the past will fill the mind with vain expectations, or with groundless alarms, concerning the future. This disposition to confound together accidental and permanent connections, is one great source of popular superstitions. Hence the regard which is paid to unlucky days; to unlucky colours; and to the influence of the planets: apprehensions which render human life, to many, a continued series of absurd terrors. Lucretius compares them to those which children feel, from an idea of the existence of spirits in the dark.

“Ac veluti pueri trepidant, atque omnia cæcis
In tenebris metuunt, sic nos, in luce timemus
Interdum nihilo, quæ tunc metuenda magis.”

Such spectres can be dispelled by the light of philosophy only; which, by accustoming us to trace established connections, teaches us to despise those which are casual; and by giving a proper direction to that bias of the mind which is the foundation of superstition, prevents it from leading us astray.”

The belief in omens was particularly strong and general among the Greeks and Romans; and there is good reason to believe that even the most celebrated philosophers among the former were nearly as much addicted to it as the most ignorant and superstitious of the vulgar. If we lay aside that extreme fondness for discovering sublime, enlightened, and mystical meanings in the doctrines of Pythagoras, and give proper weight, in estimating the character of that philosopher, to the ignorance and credulity of the times in which he lived, and which must have operated, in some degree, upon his mind and opinions, perhaps we shall be disposed to regard many of the symbols (as they are called) which are ascribed to him, not as embracing and concealing his peculiar doctrines, but as inculcating an ominous observance of the things to which they relate. Certainly several of the following symbols wear greatly this appearance. Adore the sound of a whispering wind. Stir not the fire with a sword. Turn aside from an edged tool. Pass not over a balance. Setting out on a journey, turn not back, for the furies will return with you. Breed nothing that has crooked talons. Receive not a swallow into your house. Look not in a mirror by the light of a candle. At a sacrifice pare not your nails. Eat not the heart or brain. Taste not that which hath fallen from the table. Break not bread. Sleep not at noon. When it thunders, touch the earth. Pluck not a crown. Roast not that which has been boiled. Sail not on the ground. Plant not a palm. Breed a cock, but do not sacrifice it, for it is sacred to the sun and moon. Plant mallows in thy garden, but eat them not. Abstain from beans.

Among the Greeks there were many omens connected with their sacrifices: if the beast, intended for this purpose, escaped the stroke, leaped up after it was given, did not fall flat on the ground, or kicked and stamped after its fall; or if it did not bleed freely, or appeared to expire with pain or difficulty; these were considered as unlucky omens. It was also deemed unlucky, if the victim went unwillingly to the altar; and every method, likely to answer the purpose, was followed, in order that it might be induced to nod its head, which was regarded as a token of assent; when this could be effected by no other means, it was customary to pour water into its ear. The wagging of its tail, interpreted as another mark of assent, was always regarded as a lucky omen.

Omens were drawn from every part of the victim, but especially from the liver; next to the liver, the heart was most observed: if this were small, or wrinkled, or if it

palpitated much, it was unlucky; and if the victim proved to be destitute of a heart, it was a most deadly omen. After the heart, omens were drawn from the gall, the lungs, the spleen, and the membranes, in which the bowels were enclosed.

But omens were drawn, not only from the victims themselves, but also from the things that were made use of at sacrifices: if the flames immediately caught and consumed the victim, it was a good sign; and in order to secure this, dry sticks were always prepared. The nature of the flame was also regarded: if it was bright and pure, without noise or smoke, and if it did not go out till the victim was entirely consumed, the omen was propitious.

But the principal and most numerous omens of the Greeks were drawn from birds; and this species of divination arrived at such perfection, and gained so much credit, that other kinds were passed by or little regarded, if not confirmed by it.

When the Grecian augurs, who were employed for the purpose of taking these omens, made their observations, they kept their faces towards the north; the east being consequently on their right-hand, and the west on their left. The omens which appeared towards the east were looked upon as fortunate by all the nations of antiquity, because the sun, the great fountain of light and heat, and the principal cause of fertility and animal comfort, makes his first appearance in that quarter: on the contrary, the western omens were considered unlucky, because the sun leaves the world in that quarter.

But though both the Greeks and Romans regarded those omens which were seen in the east as lucky, and those which appeared in the west as unfortunate, yet as the augurs among the former made their observations with their faces towards the north, while the Roman augurs made their observations with their faces towards the south; the signs that were presented on the right-hand were regarded by the Greeks as fortunate, and those on the left as unlucky: but among the Romans the reverse was the case. Sometimes, however, the Latin authors followed the Greek custom in their use of the word *sinistra*, and apply it to unlucky events.

Birds were considered as fortunate, or unfortunate, either from their own nature, or according to the place and manner of their appearance: hence the same birds, at different times, were supposed to foretell different and contrary events.

If a flock of birds of different kinds came flying about any man it was an excellent omen. The eagle was particularly observed for the purpose of drawing omens: when it was observed to be brisk and lively, and especially if, during its sportiveness, it flew from the right-hand to the left, it was one of the best omens which the gods could give. Respecting vultures there are different opinions, both among the Greek and Roman authors: by some they are represented as birds of lucky omen, while Aristotle and Pliny reckon them among the unlucky birds. If the hawk was seen seizing and devouring her prey, it portended death; but if the prey escaped, deliverance from danger was portended. Swallows, wherever, and under whatever circumstances they were seen, were unlucky birds: before the defeat of Pyrrhus and Antony they appeared on the tent of the former, and the ship of the latter, and by dispiriting the minds, probably prepared the way for their subsequent disaster.

In every part of Greece, except Athens, owls were regarded as unlucky birds: but at Athens, being sacred to Minerva, they were looked upon as omens of victory and success.

success. The swan, being an omen of fair weather, was deemed a lucky bird by mariners.

The most inauspicious omens were given by ravens; but the degree of misfortune which they were supposed to portend, depended, in some measure, on their appearing on the right-hand, or the left: if they came croaking on the right-hand, it was a tolerable good omen; but if on the left, a very bad one.

As the cock, when he is overcome, sits silent and melancholy, but when he obtains a victory, struts about and crows; his appearance in the former state was looked upon as the preface of defeat; in the latter state, as predicting victory.

Omens were also drawn by the Greeks from other animals besides birds: bees, it is well known, were esteemed an omen of future eloquence; but when a swarm of them lighted upon an altar, it was a very dreadful omen: this circumstance happened, according to Appian, before the defeat of Pompey. It is rather singular that toads, which are now regarded, even by people of strong and well informed minds, with a considerable degree of dread and apprehension, were accounted by the Greeks lucky omens; while the hare was considered as presaging disaster.

Thunder and lightning were deemed fortunate or otherwise, according as they occurred on the right-hand or on the left: when an unlucky omen was given by thunder, it was supposed to be averted by pouring forth a libation of wine; and in order to destroy or avert the malignant influence, when it was seen on the left-hand, it was usual to hiss and whistle at it.

Omens were also drawn by the Greeks from things which affected their own persons; from things external, "that only appeared to men, but did not make any impression on them;" and from ominous words. The most remarkable of these we shall notice.

The palpitations of the heart, the eye, or any of the muscles, and the ringing of the ears, were ominous: the omen was lucky, if the palpitations were on the right side of the body, or the ringing in the right ear. A number of rules were laid down for the purpose of ascertaining whether sneezing were fortunate, or the contrary. "When Themistocles was offering sacrifices, it happened that three beautiful captives were brought to him, and at the same time the fire burned clear and bright, and a sneeze happened on the right-hand: hereupon, Euphrantides the soothsayer embracing him, predicted the memorable victory that he afterwards obtained." Xenophon was appointed general, in consequence of a sneeze happening on the right-hand while he was making a speech. If a person sneezed between midnight and the following noon it was fortunate, but from noon to midnight, unfortunate. "If a man sneezed at table while they were taking it away, or if another happened to sneeze upon his left-hand, it was unlucky; if on the right-hand, fortunate. If, in the undertaking any business, two or four sneezes happened, it was a lucky omen, and gave encouragement to proceed: if more than four, the omen was neither good nor bad: if one or three, it was unlucky, and dissuaded them from proceeding in what they had designed: if two men were deliberating about any business, and both of them chanced to sneeze together, it was a prosperous omen." Potter's Antiquities, vol. i. p. 339.

A very numerous and important class of omens were those which were drawn from things which presented themselves in the way, called by the Greeks *Ενδοια συμβόλα*; the meeting of an eunuch, a black, an ape, a bitch with whelps, a vixen with cubs; a snake lying in the road, so as to oblige the company to divide; or a hare crossing the

path, were deemed bad omens. Some things were regarded as portending evil consequences to the husbandman: if, while he was going to sow his land, he saw a woman at work with her spindle, or carrying it uncovered, he anticipated a bad harvest. If, on the meeting of a public assembly, a weazel was observed to cross the path, no business was done: a most curious reason is given by Artemidorus for regarding this omen on this occasion; because *γελῶν*, the Greek word for a weazel, is *ισοψηρος* to *δική* (a public assembly, or judgment), i. e. the letters in each word signify the same number, viz. 42.

When the Greeks went to supplicate the gods to obtain any favour, or to avert any calamity, it was usual to touch the knees of the statue; if they had hopes, they touched the right-hand; if they were confident of obtaining the object of their prayers, they rose as high as the chin or cheeks, but in no case did they ever touch the left-hand of the statue, as that was deemed unlucky.

Before they set out on any military expedition, it was usual to let fly a dove, which was considered as an omen of safe return, as that bird is not easily induced to relinquish its habitation, but when driven away constantly returns.

The uttering many words was considered as ominous; therefore the Greeks never made use of the terms which directly expressed *death*, but conveyed their meaning on this subject by indirect and softening terms; of which is very remarkable and expressive, *απογενεσθαι*, to which the Latin word *denascei* answers, used on the same account: instead of the word signifying a prison, they used one signifying a house; and they were even careful not to call their deities by their appropriate appellations, if these appellations were words of bad omen; they therefore generally addressed the furies, *Ερινυες*, by the names *Σεμναι θεαι*, or *Ευμενιδαι*.

It was customary for them to clothe their dead in white garments, whence it was reckoned an unlucky omen, and foretelling death, for a sick person to have white apparel; and if a person dreamt of a fire being extinguished during the sickness of any in the same family, it was deemed a certain forerunner of death.

Persons in affliction suffered their hair to grow long: to cut or shave the hair was a token of joy: mariners, upon their delivery from shipwreck, used to shave themselves; hence, if they dreamt of having the whole head shaved, it was an omen that they would undergo great dangers at sea, but escape from them. The younger Pliny, in one of his epistles, mentions that he dreamt he had cut off his hair: and this dream he interprets to signify his deliverance from some great and imminent danger. Men, however, who were labouring under misfortune, though they did not permit others to shave them, sometimes shaved themselves; hence for a man to dream of shaving himself was a preface of some great calamity.

It was usual among the Greeks to bedeck the tombs with flowers, herbs, and ribbands: parsley was especially used for this purpose; hence it was regarded as a bad omen. As Timoleon was proceeding to reconnoitre the position and strength of the Carthaginian army, he was met by a number of mules loaded with parsley; this his soldiers conceived to be an unlucky omen; but Timoleon with much ingenuity and presence of mind converted it, in the opinion of his troops, into an omen of victory, by recalling to their recollection, that, at the Isthmian games, the Corinthians crowned the victors with chaplets of parsley, accounting it a sacred wreath: in order to impress this interpretation of the omen more strongly on them, he first made himself a chaplet, and then his captains and all the soldiers followed his example. With like address, Epaminondas

nondas converted the bad omen which his soldiers drew, from the circumstance of a ribband that hung on his spear being carried by the wind to a Lacedæmonian sepulchre, into a presage of the defeat of the enemy, by assuring them, that as the ribband had been carried to the sepulchre of the Lacedæmonians, it must portend death to them, and not to the Thebans.

The Greeks were particularly careful not to marry, except at propitious seasons. January was esteemed the most fortunate month; and the marriage was expected to be most fortunate, if it were celebrated at the time of full moon. Other things were also regarded as ominous respecting their marriages; if a pair of turtles appeared during the celebration, it was deemed lucky, and a presage of domestic concord. The crow appearing denoted long life to the married pair, if it appeared with its mate; but if it was seen single, separation and sorrow were portended, whence it was customary at nuptials for the maids to watch, that none of these birds, coming single, should disturb the solemnity. If pregnant women were delivered without pain, and especially if they brought forth twins, it was regarded as a good omen, a convincing proof of chastity, and a peculiar mark of divine favour. Soon after the children were born, they were placed in winnowing vans, which were looked upon as omens of their future prosperity and riches.

There were several modes of averting bad omens; Pliny expressly declares, that the force and efficacy of the omen depended upon the persons to whom they appeared. If the omen was taken by the hearer, or struck upon his imagination, it was efficacious; but if neglected, or not taken notice of, it was of no force. Julius Cæsar never was deterred by them from any undertaking: Augustus, on the contrary, was remarkably superstitious, and frequently desisted from his designs on their account. The most effectual mode to avert an omen was either to throw a stone at a thing, or to kill it outright, if it was an ominous animal; by this means, the evil which it portended was supposed to fall upon its own head: if it was an unlucky speech, it was customary to retort it upon the speaker. At the sight of a madman, or one troubled with epilepsy, it was customary to spit three times into their bosoms, to express that they held the omen in contempt and aversion. Frequently, however, when the Greeks met an unlucky omen, they desisted from what they were doing, and began it anew. Euripides describes a person, on hearing an ominous word, throwing the cup out of which he was about to drink upon the ground, and calling for another.

As the omens of the Romans were nearly similar to those of the Greeks, we shall only notice such as were peculiar to them. Chickens were regarded as affording such important omens, that a person, called *Pullarius*, was expressly employed to keep them: omens drawn from them were had recourse to before commencing an engagement. If the chickens came too slowly out of the cage, or would not feed, it was a bad omen; but if they fed greedily, so that some part of their food fell and struck the ground, it was deemed an excellent omen. In the very early times of the republic, before an army passed a river, a kind of auspices were taken from examining the beaks of birds; but Cicero says, this had fallen entirely into disuse in his time.

When Cæsar landed at Adrumetum, in Africa, with his army, he happened to fall on his face; this was regarded as a bad omen; but he, not being accustomed to pay attention to presages, and therefore, possessing great presence of mind on the occasion, turned it to the contrary; for taking hold of the ground with his right hand, and kissing it, as if he had

fallen on purpose, he exclaimed, "I take possession of thee, O Africa."

Augustus, on the contrary, as has been already observed, was remarkably superstitious. When the Greeks and Romans put on their clothes, the right side was served first; and, therefore, if a servant gave his master his left shoe first, it was regarded as a bad omen. This omen Augustus regarded with a peculiarly strong superstitious dread; and this was much increased when one day, his left shoe having been put on before his right, he was nearly destroyed by a mutiny among some of his soldiers. He also paid particular attention to lucky and unlucky days; he never went abroad upon the day following the *nundina*, nor began any serious undertaking on the *nones*. It was, indeed, a general opinion among the Romans, that the days immediately following the *nones*, *ides*, and *kalends*, were unfortunate. The emperor Valentinian considered the 24th of February, in the bissextile year, as so very unfortunate, that having been chosen emperor on that day, he was afraid to shew himself in public, lest some evil should befall him. (Ammian. Marcell. lib. xxvi. cap. 1.) The emperor Charles V., on the contrary, regarded that as one of the most lucky days. (Bayle, Pensées diverses, p. 47.) The day on which the Romans suffered their memorable defeat from the Cimbrians, was long viewed as a most unfortunate day; and no general, if he could possibly avoid it, would begin a battle on it. When Lucullus expressed his determination to attack Tigranes, king of Armenia, on that day, his officers unanimously and strongly opposed him; but he persisted in his design, gave battle, completely routed the enemy, obtained one of the most signal and important victories recorded in Roman history, and changed the character of the day from unfortunate to fortunate, as he foretold he would, when his officers endeavoured to dissuade him from fighting.

The Romans paid particular regard to lucky and unlucky names; at public lustrations, the persons who brought the victories, were required to have *bona nomina*, fortunate names; and regard was had to the same circumstance in raising their levies: especial care was taken that the first man who enrolled himself should have a name of good augury; and the censors, in taking the census of the citizens, always began with a fortunate name, such as Valerius, Salvus, &c.; and in the adjudication of public property, they began with some that had a fortunate appellation, *boni omnis ergo*. Festus relates, that the scrupulous regard to names of good and bad omens, was so minute and excessive among the Romans, that the women, during their pregnancy, offered sacrifices to the goddesses Egeria, because the name Egeria had a close relation to child-delivery, "*quod eam putarent facile fœtum alvo egerere*."

When Julia, the wife of the emperor Severus, had rendered herself infamous by her debauched and profligate course of life, her husband consoled himself for his misfortune, by his belief that her name was one of bad omen; all who had borne this name, in his opinion, having been remarkable for loose and lewd manners.

The oriental nations carry their belief in, and regard to, omens to as great a length as the Greeks and Romans did. The Persians have distinct and appropriate names for the different kinds of omens: *teryk* signifies that kind, by which, by throwing pebble-stones or gravel, future events are prefigured: *eyaf*, divination from birds, the sight of which is observed as carefully as it was among the Greeks or Romans: *kari* is the name of a bird with a long beak, which the Persians and Arabians consider as a bird of good omen, and which they are always glad to meet. If a deer is seen descending

descending from a mountain, or behind the beholder, it is regarded as an unlucky omen, and to omens of this character the name *kades* is given.

The oriental nations also are very attentive to fortunate and unfortunate days; about the middle of February, they celebrate a feast in honour of the angel *Isfendarmuz*, the guardian of the fair sex; and marriages contracted during this solemnity were regarded as peculiarly fortunate. If an Asiatic, when he is setting out on important business, meets with a person whom he supposes to have an unlucky foot, (*shum kudem*;) he immediately returns; and if an involuntary cough or sneeze interrupt the Mahometans during their ablutions, the whole service is began anew, and that as often as it happens. Before a married man sets out on a long journey, he twists, in a particular manner, two branches of the broom called *retem*; and if, on his return, he finds them still twisted, it is an omen of the fidelity of his wife; but if they are untwisted, he regards it as such an unfortunate omen, that nothing will induce him to believe her innocent. By a singular mode of augury, they endeavour to foretell the weather; they tie some combustible matter to the tail of a bullock, to which they set fire; if the animal runs up the hill, they consider it as a sure prognostic of rain. When a Persian peasant wishes the wind to rise for the purpose of winnowing his corn, instead of whistling, as is common in different parts of Europe, he rubs and scatters into the air a species of saffron, and by this means anticipates what he desires.

In the east there are certain insects, the name and species of which are not well known, which are accustomed to utter a mournful and solemn hum during the night; whenever they are heard great evil is presaged.

Tamerlane was very attentive to lucky and unlucky days; and he seldom put his army in motion, and never engaged in battle, till the astrologers had fixed the fortunate hour: an idiot having once thrown a breast of mutton at him, while he was planning the conquest of *Kharezme*, sometimes called the *breast of the world*, he interpreted it before all his army as an infallible omen of his success.

The ancient Germans made much use of the horse in their omens; these animals, especially such as were white, were kept at the public expence, and not allowed to be worked for the use of man; the presages were drawn from the mode and time of their neighings. When they were about to engage in any military enterprise, they set up three rows of spears, each row consisting of a certain number fixed in the ground, and one laid across the top: when they were thus fixed, a horse was brought out by the priest, and led to the spears; if he advanced in such a manner, that his right foot reached the spears first, the omen was fortunate; but if his left foot advanced before his right, the omen was unlucky: this ceremony was repeated before each of the rows of spears; it was also observed before they embarked on any naval expedition. When the northern nations were converted to Christianity, and indeed for a considerable time afterwards, they were so devoted to this and similar superstitions, that a decree of one of the councils expressly treats *de auguriis vel avium, vel equorum, vel boum stercore, vel sternutatione*.

Women were appointed by the ancient Germans, as well as men, to observe the omens; and one of the most singular to which they paid especial attention, was derived from observing the motions and eddies of a stream of water.

Formerly, in Iceland, if a lambent flame was observed on the surface of the ground, a circumstance by no means un-

common in that country, it was regarded as a good omen; hidden treasure was believed to lie in the ground where the flame was seen.

A most barbarous and inhuman mode of prefaging future events was practised among the Scandinavians; they sacrificed human victims for the express and sole purpose of knowing what was to happen, by the inspection of their entrails, by the effusion of their blood, and by the greater or less degree of celerity with which they sunk to the bottom of the water; when the last mode was followed, the victim was thrown into a deep well in the neighbourhood of the temple, in honour of *Goya*, or the earth; if he went at once to the bottom, the omen was good; but the reverse, if he swam a long time on the surface. If, when the victim was burnt, the smoke ascended very high, it was regarded as a most fortunate omen.

The number three, and its combinations, was regarded as uncommonly fortunate by the Scandinavians, as it was, indeed, by other ancient nations, and as it still is amongst us. Every ninth month they renewed their most solemn sacrifices, which were to last nine days, and on every day nine living victims, men or animals, were to be offered up. When Olug Nuvin, the youngest of Jenghiz Khan's sons, as master of the household, presented his eldest brother with a cup of wine, all the people, hailing him emperor, made nine genuflexions to him, as their sovereign, and three to the sun; the number nine was, indeed, in great veneration among the Tartars; when they made presents to their princes, the number of them was always nine: this number, and its combinations, was always attended to at their feasts, in their dishes and skins of wine; and even the roving Tartars robbed the caravans by this rule, and would rather take nine of any thing than a greater number. The old Irish, in the elections of their *tanists*, used to deliver a wand to him whom they meant to raise to that dignity, he having previously ascended a high stone; and as soon as he had received the wand, he descended and turned himself round, thrice forward and thrice backward.

But to return to the Scandinavians; they as well as all the other northern nations paid great attention to particular days, and especially to the age of the moon; if possible, they avoided engaging in battle before the new moon; and the moon, when new or full, was regarded as the most auspicious for all enterprises. The Anglo-Saxons had their lucky and unlucky days for bleeding. Theodore, the monk, taught them that it was dangerous to bleed when the light of the moon and the tides were increasing; and he pointed out the particular hours of the day when it might be done with safety and advantage. The reason, if reason it can be called, of considering the increasing moon as propitious in some cases, and the waning moon as propitious in others, will be stated, when we come to treat of the omens of the Highlanders.

Indeed, among the Anglo-Saxons, as among the Greeks and Romans, every day in every month was propitious or unpropitious for some action or another; and thunder, lightning, the new moon, and new year, were lucky or not, according to the day on which they happened. Among the Druids, the sixth day of the moon was considered as a most propitious day for embarking on any undertaking, or beginning a journey.

As the manners and customs of the ancient Britons were derived from those of the Scandinavians, or Celts, their superstitious ideas, with respect to omens, were so nearly the same, that they need not be detailed. It may, however, be remarked, that the hare was much employed by the ancient Britons

Britons for the purposes of augury, and it was therefore interdicted at table.

In the first ages of Christianity, the belief in omens was very prevalent and strong. Ambrose, Noy bishop of Noyon, Chrysostom in his Homilies, Basil, Augustin, and others, inveigh bitterly against it; from their account, the omens, in which the first Christians put faith, were very similar to those which prevailed among the Greeks and Romans; sneezing under certain circumstances; meeting on the road a cat, a dog, a woman of bad character, a person with one eye, or a lame person; stumbling against any thing, or when one was going out of the house, being held back by the cloak catching any thing; the palpitation of an eye or muscle; and innumerable other omens, are mentioned and reprobated by these fathers.

Perhaps no change that has taken place within these last fifty years, is greater or more striking, than that which has gradually been effected in the superstitious belief of the common people in this kingdom, and probably, though not to such a great degree, in the other kingdoms of Europe. In the middle of the last century, the belief in fairies, witches, omens, and superstitious powers and practices, prevailed, almost universally, among the lower orders of the community, and even had fast hold on many of a superior rank and condition of life, especially in the country. Now this belief is scarcely found, except among very old people, and in very remote places; and where it does exist, it is regarded by the generality of the lower class in its proper light. The following enumeration of lucky and unlucky omens, therefore, has reference, rather to popular belief, about the beginning or middle of the last century, than to the present time; except, as has been already stated, in remote places, and among old people.

It appears to have been the popular belief in this country, (though probably prior even to the period we have mentioned) that one of the most unlucky omens that could possibly happen, was the sneezing, or the dreams of an old woman; this, no doubt, arose from old women being commonly regarded as witches; and it was a common saying, that an old woman could believe what she chose.

In the days when the belief in omens flourished in England, the following were deemed lucky: if, on setting out on a journey, a sow with pigs were met, the journey would be successful; to meet two magpies portended marriage; three, a successful journey; four, unexpected good news; and five, that the person would soon be in the company of the great. If, in dressing, a person put his stockings on wrong side out, it was a sign of good luck; but the luck would be changed, if the stockings were turned the right way. Nothing could ensure success to a person going on important business, more effectually than throwing an old shoe after him, when he left the house. If a younger sister were married before the elder ones, the latter should dance at her wedding without shoes, otherwise they will never get husbands. To find a horse-shoe is deemed lucky, and it is still more so, if it be preserved and nailed upon the door, as thus it prevents witchcraft.

In England, and more particularly in Wales, according to Pennant, it is a good omen, if the sun shines on a married couple, or if it rains when a corpse is burying. According to the old distich,

“Happy is the bride that the sun shines on,
Happy is the corpse that the rain rains on.”

There were also lucky and unlucky days: according to Sir Thomas Browne, in his *Vulgar Errors*, there were certain days, when alone, the common people would pare their nails, or have their hair cut; and he adds, that the Romans

carefully abstained from doing these things on the *Nundina*.

Even yet, Valentine's day is regarded as ominous, in respect to marriage, by more than the lower classes: and if it rain on St. Swithin's day, rain it will for forty days afterwards. The moon, even by philosophers, is supposed to indicate the weather; but the vulgar regard her as foretelling it, much in the same manner that other omens preface future events. If the change in the south-west quarter, *i. e.* if the change about four or five o'clock in the afternoon, when the sun is in the south-west, it portends rain; if in the north, or north-east, *i. e.* at that time of the evening when the sun, if we supposed him not to set, would be in the north or north-east, cold weather is portended. Catholics bleed their horses on St. Stephen's day, and on the festival called *Annunciation*.

The unlucky omens in England are, to see one magpye, and then more; but to kill a magpye is a terrible misfortune. It is also unlucky to kill a swallow, or more properly the house marten. If, on a journey, a sow crosses the road, the person, if he cannot pass it, must ride round about, otherwise bad luck will attend his journey. If a lover presents a knife or any thing sharp to his mistress, it portends that their loves will be cut asunder, unless she take a pin, or some other trifling article in exchange. To find a knife or a razor portends disappointment: a piece of coal, starting from the fire, of a hollow form, portends death. To spill the salt, or lay the knife and fork across each other at table, is very ominous: if there be in company thirteen, which is called the devil's dozen, some misfortune will befall one of them. The noise of the small insect called a death-watch, foretells death; and the screech-owl at midnight, some terrible misfortune.

If the cheek burns, or the ear tingles, it is a sign that some person is talking of one; and the coming of strangers is foretold by what is called “a thief” in the candle. Friday is an unlucky day to be married, and yellow is an ominous colour for an unmarried woman to wear; in plucking a “merry-thought,” the person who gets the largest share will be married before the other.

In the Highlands omens are numerous: it is unlucky to stumble at the threshold, or to be obliged to return for any thing forgot. To step over a gun, or a fishing-rod, spoils sport. If, when the servant is making a bed, she happens to sneeze, the sleep of the person who is to lie in it will be disturbed, unless a little of the straw (with which most beds in the Highlands were, till very lately, filled) is taken out, and thrown into the fire. If a black cloud, on New Year's eve, is seen, it portends some dreadful calamity, either to the country, or to the person over whose estate or house it appears. The day of the week on which the third of May falls is deemed unlucky throughout the year. Friday is considered as unlucky for many things, especially for digging peat, or taking an account of the sheep or cattle on the farm. Under the persuasion, that whatever is done during the waxing of the moon grows, and whatever is done during her waning decreases and withers, they cut the turf which they intend for fences, and which, of course, they wish to grow, when the moon is on the increase; but the turf which they intend for fuel, they cut when she is on the wane, as they wish it to dry speedily. If a house take fire during the increase of the moon, it denotes prosperity; if during her wane, poverty. In the island of Mull, the first day of every quarter is deemed fortunate; and Tuesday is the most lucky day for sowing their corn. The lucky omens in the Highlands are not many, and in general they are the same as those in other countries: one, however, seems peculiar to them,

them, it is deemed lucky to meet a horse. In the Orkneys, Friday, which in most other places is reckoned an unfortunate day for this purpose, is generally chosen for marriage; next to it, Thursday is fixed upon; and the time when the moon is waxing is the most fortunate. When an Orkney fisherman is setting off from the shore, he takes especial care to turn his boat in the direction of the sun's motion; if he neglected this, he would not expect good luck. In the lowlands of Scotland, good or bad fortune throughout the year is thought to depend greatly upon the person who is first seen on New Year's morning, or the "first foot," as it is called; if the "first foot" be that of a friend, and a fortunate person, the subsequent year will be fortunate. Under this idea, as soon as ever twelve o'clock at night announces the commencement of the New Year, it is customary, even in Edinburgh, to secure a lucky "first foot" to one's friends, even though it should be necessary to enter their chamber when they are fast asleep.

OMEN Prærogativum, among the Romans, was the vote of the first tribe or century in their comitia.

When a law, &c. was proposed, or an election to be made, an urn was brought in to the priests there present, into which were cast the names of the tribes, or centuries, or curiæ; as the comitia were either tributa, centuria, or curiata. And the lots being drawn, that tribe, century, &c. whose name came up first, was called *tribus*, or *centuria prærogativa*, because their voices were asked first. And so much did the Romans depend on this prerogative century, that the rest generally followed them. Hence a person who had the voices of the prerogative was said to have *omen prærogativum*.

OMENTAL RUPTURES, in *Surgery*. See **EPIPLOCE** and **HERNIA**.

OMENTUM, in *Anatomy*, a part contained in the abdomen, and called in common language the caul. See **EPIPLOON**.

OMER, in the *Jewish Antiquity*. See **CORUS**.

OMERA, in *Geography*, a town of Arabia, in the province of Yemen; 16 miles N. of Aden.

OMEREE, a town of Hindoostan, in the circar of Ellickpour; 20 miles S.W. of Ellickpour.—Also, a town of Hindoostan, in Boggilcund; 6 miles W. of Rewah.

OMEREQUI, a town of Peru, in the diocese of La Plata; 50 miles N. of La Plata.

OMERGONG, a town of Hindoostan, in Baglana; 7 miles S. of Damaun.—Also, a town of Hindoostan, in the circar of Aurungabad; 32 miles E. of Aurungabad.

OMERPOUR, a town of Hindoostan, in the circar of Aurungabad; 40 miles E. of Aurungabad.

OMETEPEC, a river of Mexico, which runs into the Pacific ocean, N. lat. 16° 52'.—Also, a small island in the lake of Nicaragua; 25 miles E. of Nicaragua. N. lat. 11° 30'. W. long. 86° 6'.

OMEY, an island off the west coast of the county of Galway, Ireland. It appears to have been the seat of the parish church. N. lat. 53° 31'. W. long. 10° 7'.

OMI, or **OITS**, a large lake in the island of Nippon, 100 miles in length, and 10 in breadth; 15 miles N.E. of Meaco.

OMILPALLAH, a town of Hindoostan, in the circar of Mahur; 42 miles N.W. of Mahur.

OMISSION, in *Rhetoric*. See **PARALEPSIS**.

OMITA, in *Geography*, a town of Hindoostan in Guzerat; 28 miles E. of Cambay.

OMITTAS, in *Law*. See **NON OMITTAS**.

OMLI, in *Geography*, a town of Norway; 40 miles N.N.E. of Christianland.

OMMAGANG, a town of Norway; 48 miles S. of Porfanger.

OMMEN, a town of Holland, in the department of Overissel, on the Vecht; 18 miles S.E. of Covorden.

OMMIRABIH. See **MORBEYA**.

OMMO ZAIDI, a country of Africa, on the coast of Ajan, 70 miles from the sea, about N. lat. 6°.

OMNES, in the *Italian Music*, a Latin term, which we sometimes find used for *tutti*, *all*, or *altogether*.

OMNIUM is a term of finance, denoting all the particulars included in the contract between government and the public for a loan; such as stock at three or four *per cent.*, lottery-tickets at a stipulated price, annuities for a certain term, &c.

OMO, in *Geography*, a small island in the East Indian sea, near the E. coast of Amboyna. S. lat. 3° 31'. E. long. 128° 51'.

OMOA, or *St. Francisco de Omoa*, a fortified sea-port town of Mexico, in the province of Honduras. This is a fortress of importance, as it is the key of Honduras, and in time of war, the receptacle of the treasure sent from Guatemala. N. lat. 15° 50'. W. long. 89° 53'.

OMÖE, a small Danish island, in the Great Belt; 10 miles S. of Corfoer. N. lat. 55° 10'. E. long. 11° 10'.

OMOHYOIDEUS, or **OMOPLATOHYOIDEUS**, in *Anatomy*, a muscle of the neck. See **DEGLUTITION**.

OMOLEY SINAB, in *Geography*, a town of Algiers; 34 miles S. of Constantina.

OMOLON, a river of Russia, which runs into the Kolima; 20 miles E.S.E. of Niznei Novimskoi.

OMONPHON, a small island in the East Indian sea, near the coast of Samar. N. lat. 11° 7'. E. long. 125° 45'.

OMONT, a town of France, in the department of the Ardennes, and chief place of a canton, in the district of Meziérès; 10 miles S. of Charleville. The place contains 484, and the canton 5151 inhabitants, on a territory of 107½ kilometres, in 13 communes.

OMOPHAGI, formed of *ωμος*, *crude*, and *φαγω*, *I eat*, among the ancient geographers, a name given to certain nations who fed on raw flesh, as the Scythians, &c.

OMOPHORUM, formed from *ωμος*, *shoulder*, and *φερω*, *I bear*, a little cloak, anciently worn by the bishops over their shoulders, thereby to represent the good shepherd, who brings home the strayed sheep on his shoulders.

For this reason the omophorium was put off at the opening of the Gospels; because then the true shepherd, Jesus Christ, was supposed present in person.

Some confound the omophorium with the pallium worn by the patriarchs; but there was this difference, that the pallium was a long cloak of purple, and was peculiarly reserved for patriarchs; though since given to some bishops, by way of distinction.

OMOPLATA, in *Anatomy*, from the Greek *ωμοπλατη*, the scapula.

OMPANORATE, an appellation given to the priests of the island of Madagascar.

These are the schoolmasters of the country, and teach Arabic and writing. They have several books, but none of them contain more than some chapters of the Alcoran, and a few physical recipes.

They are divided into several orders, bearing some resemblance to our ecclesiastical dignities; as *ombiaffe*, secretary or physician; *tibon*, subdeacon; *mouladzi*, deacon; *faqubhi*, priest; *catibon*, bishop; *lamlamaba*, archbishop; *ompitfiguili*, prophets or diviners; *fababa*, calif, or the chief of the religion.

The ompanorates deal much in talismans, and other charms, which

which they call *bitidzi*, and which they sell to the grandees of the place. They also make little statues, or images, called *auli*, which they consult as oracles, and to which they ascribe various powers; as the making rich, destroying enemies, &c. They have public schools, where they teach their superstitions and fortileges.

The *omphigouli* practise geomancy, and are mostly consulted on diseases, and the success of affairs; resolving all questions by figures drawn on a little table covered with sand.

OMPHACION, *ομφακιον*, derived from *ομφαξ*, *unripe grape*, in *Pharmacy*, the juice of four or unripe grapes.

Some have also given the name to a kind of oil, pretended to be drawn from olives, while yet green and sour. But Pomet charges it as an imposture, adding that olives yield no oil at all till perfectly ripe.

OMPHACITIS, a name given by naturalists to a small sort of gall of the oak.

OMPHACOMELI, a sort of oxymel made of the juice of unripe grapes and honey.

OMPHALEA, in *Botany*, a name altered by Linnæus, the genus having been originally called *Omphalandria*, in Browne's History of Jamaica, p. 334. The word is derived from *ομφαλος*, and alludes to the umbilicated shape of the anthers.—Linn. Gen. 479. Schreb. 657. Willd. Sp. Pl. v. 4. 569. Swartz. Prodr. 95. Obf. 349. Mart. Mill. Dict. v. 3. Juss. 392. Lamarck Dict. v. 4. 548. Illustr. t. 753. Aubl. Guian. 842.—Class and order, *Monoclea Monadelphica*. Nat. Ord. *Tricocca*, Linn. *Euphorbia*, Juss.

Gen. Ch. Male Flowers, *Cal.* Perianth inferior, of four or five ovate, spreading leaves, the two opposite ones larger, convex, coloured. *Cor.* none. Nectary of four glands; making a fleshy ring round the filament. *Stam.* Filament columnar, thick, short; anthers two or three, oblong, incumbent, connate at their tops, bearing pollen at their edges; when there is a single anther, it is convex or flat and three-cleft. Female Flowers in the same cluster with the males. *Cal.* Perianth inferior, of five leaves, three of them larger, ovate, surrounding the germen. *Cor.* none. *Pist.* Germen superior, roundish, very short; style none; stigma three-cleft, broadish, obtuse. *Peric.* Capsule oblong or roundish, fleshy, obtusely triangular, of three cells and three valves. *Seed.* Nuts solitary, ovate, hard.

Eff. Ch. Male, Calyx of four leaves. Corolla none. Nectary a fleshy ring. Filament columnar, the anthers inserted into it. Female, Calyx of five leaves. Corolla none. Stigma three-cleft. Capsule fleshy, three-celled. Nuts solitary.

1. *O. diandra*. Linn. Sp. Pl. 1377. Aubl. Guian. t. 328. (*O. cordata*; Swartz. Prodr. 95. Obf. 350. *Omphalandria frutescens diffusa*, foliis amplioribus ovatis, petiolis biglandulis, racemis terminalibus; Browne Jam. 334.)—Clusters compound, leafy, terminal. Leaves scattered, heart-shaped, villose beneath, biglandular at the base. Stem climbing.—Native of rocky, shrubby spots in Jamaica, and other parts of the West Indies. Stems shrubby, roundish, downy, rather divided and diverging. Leaves alternate, stalked, heart-shaped, pointed, coriaceous, thick, entire, smooth, downy beneath; footstalks long, lax, biglandular. *Stipulas* small, lanceolate, deciduous. Clusters terminal, compound, branched, diverging, loose. Bractes lanceolate, obtuse, smooth, placed at the base of each simple cluster of flowers, which are numerous, small and green. Capsule yellowish, containing three brittle nuts, with oblong angular kernels.

2. *O. triandra*. Linn. Sp. Pl. 1377. Amoen. Acad. v. 5. 408. (*O. nucifera*; Swartz. Prodr. 95. Obf. 351.

t. 10. f. 6. *Omphalandria foliis obovatis glabris*, ad basin biglandulis; floribus triandris; Browne Jam. 335, but not his t. 22. f. 4, according to Swartz.)—Clusters compound, leafy, terminal. Leaves oblong, biglandular at the base. Stem arboreous.—Native of woods in Jamaica, and not unfrequently cultivated there. This tree is from twelve to fifteen feet high, erect, with a smooth bark. Branches spreading horizontally, deflexed and rather divided. Leaves alternate, stalked, elliptically elongated, scattered, drooping, attenuated, and bearing two glands at the base, obtuse at the end, entire, smooth, ribbed; footstalks deflexed, long, roundish, smooth. Clusters terminal, amongst the leaves, solitary, compound, drooping, lax. Nuts very hard, black, their kernels white, surrounded with a yellow membrane. The nuts, which are highly flavoured, are esculent; and the stalks and branches emit an aqueous fluid. The English at Jamaica call this tree *Cobnut*, and the French *Noisetier*.

We think the reason given by Swartz for changing the Linnæan specific names of the above two species, is by no means satisfactory, as his other two diandrous ones are now made a new genus, *Epiphyllum*, in his Fl. Ind. Occ. 1095.

OMPHALOBium, so called by Gærtner, from *ομφαλος*, the navel, and *λοβος*, a pod or legume, is, if we mistake not, no other than *Connarus monacarpus* of Linnæus. Jussieu perceived its affinity to *C. africanus*; see his Gen. 453, and Gærtner t. 46. The name alludes to a depression on each side of the scar, or umbilicus, of the seed.

OMPHALOCele, from *ομφαλος*, the navel, and *κηλη*, a swelling, a term in *Surgery*, signifying a rupture of the navel. See *HERNIA*.

OMPHALODES, in *Botany*, *ομφαλωδης*, from *ομφαλος*, the navel, was adopted by Tournefort for the name of a genus which he founded upon some plants referred by Linnæus, perhaps not correctly, to *CYNOGLOSSUM*; see that article. The plants in question are very remarkable for the umbilicated form of their seed-cases, and in other respects differ greatly from *Cynoglossum*.

The same word is retained as the specific appellation of a *Lichen*, to which it is by no means exclusively suitable, though taken from its characteristic denomination in Vaillant. The term is equally applicable to the shields of a great number of neighbouring species, at some period or other of their growth.

OMPHALOMANTIA, a word used by some authors to express a sort of divination pretended to by the midwives and old women, of telling how many more children a woman is to have, by examining the number of knots on the umbilical cord.

OMPHALOPTER, or **OMPHALOPTIC**, in *Optics*, a glass that is convex on both sides, popularly called a convex lens.

OMPHALOTOMIA, from *ομφαλος*, and *τεμνω*, to cut, the operation of dividing the navel-string.

OMPHALUS. See **ENTEROMPHALUS**, **EXOMPHALUS**, and **HYDROMPHALUS**.

OMPHALUS, in *Natural History*, a term used by the ancients to express what they at other times call *umbunculus* in stones; that is, a small round and prominent spot, in the centre of the stone.

The *zmilampis*, which was a kind of *oculus beli* found in the Euphrates, had usually a blue prominent pupil, and this was called *omphalus*, and *umbunculus*, indifferently, and so in other stones. The words have both the same origin, and are used to express its being like the button, or prominent piece, in the middle of a shield called by the Greeks *omphalos*, and by the Latins *umbo*.

OMPHAX, the name the ancients gave to a gem of the pellucid

pellucid kind, and of a disagreeable greenish colour, with a mixture of yellow. Pliny, and some other old writers, make this a kind of the aqua marine, calling it the *berillus oleaginus*; but the earlier writers very justly determined it not to be of the beryl kind, but properly a distinct species of gem; and therefore very properly called it by a peculiar generic name.

OMPOMANOOSUCK, in *Geography*, a furious but short river of Vermont, which, after pursuing a S.W. course, discharges itself into the Connecticut at Norwich, opposite to Dartmouth college.

OMPTAH, a town of Bengal; 21 miles W. of Calcutta.

OMRAUTTY, a town of Hindoostan, in the country of Berar; 20 miles S.S.E. of Ellickpour. N. lat. $20^{\circ} 55'$. E. long. $78^{\circ} 16'$.

OMSK, a town and fortress of Russia, in the government of Tobolsk, on the river Om, when it unites with the Irtysh, built in 1716, and well garrisoned. N. lat. 55° . W. long. $74^{\circ} 54'$.

OMTCHOU, a river of Thibet, which runs into the Nitchon, near Tarendfang.

OMTRAGER *la Lumière* of a pipe, in *Organ Building*, is soldering to the sides of the mouth two small plates of the same metal; these plates are called *ears*. By opening and closing these ears, pipes of this kind are tuned.

OMURA, in *Geography*, a town of Japan, in the island of Ximo; 15 miles N.N.E. of Nagasaki.

OMY, in *Agriculture*, a provincial term employed to signify mellow, when spoken of land. It is often written *omy*.

ON, in *Scripture Geography*, called also *Onion* and *Onium*. See HELIOPOLIS.

There were two cities of the same name, the one, as Pliny terms it, interior, and the other without, of less note, really situated in Arabia, and modern in comparison with the former. It lay to the E. of the Nile, and to the S. of the Arabian canal, at the distance of 12 miles from Babylon, and 24 from Memphis. It is mentioned, says the learned Bryant, by several writers, under the name of Heliopolis; but its true name was Onium, which it received from Onias, the son of Onias a Jew, who built it. Onias, as it has been said, having fled from his own country, had a great inclination to build a temple in Egypt resembling that at Jerusalem, or rather in opposition to it. In effecting his purpose, he found great difficulty; and in order to gain the assent and assistance of his brethren, in that part of the world, he had recourse to a prophecy (Isaiah xix. v. 18, 19.) which he interpreted as favourable to his scheme. According to Scaliger, Onias was led to the choice of the prefecture of Heliopolis for erecting his temple by this prophecy; altering the expression so as to render it more favourable to his design. His temple, however, was not founded in the name of Heliopolis; and this name was given to it by a mistake resulting from a similitude that subsisted between the true name "Onion," and the ancient "On," or Heliopolis. Of this he availed himself, for rendering the passage in Isaiah prophetic of the establishment of his temple. The name indeed was given to it after it was built, and the prophecy was used to support what was done rather than to promote it, so that there seems to have been a collusion between Onias and those of his party, to impose this name upon the place; in order that it might be entitled to the benefit of the prediction. This is plain from the LXX, (Exod. i. 11.) where the words "On, which is the city of the Sun," are interpolated, in order to support the pretensions of Onias, and to prove that this was the name of the place which he

had founded. According to this account, the city of Onias is said to have been built when the Israelites had resided some time in Egypt; for they are presumed to be the builders; but there was another of the same name, the ancient On, previously mentioned in the same translation; and was prior to their coming into these parts. It is said that Joseph, before the coming of his brethren, had married the daughter of the priest of On, at the recommendation of Pharaoh, which On, the LXX very properly translate Heliopolis. (See Gen. xli. 45.) Notwithstanding the account given by Josephus (Antiq. lib. xiii. c. 3.) of the temple of Onias, and the occasion of its being built, Bryant conceives that the place allotted to him for this purpose was not Heliopolis, but Onium, the situation of which was exterior with respect to Egypt; and this was so similar to the ancient On or Heliopolis, that it obtained that name; a name which it never received till after it was built; and then the prophecy was made use of by Onias and his friends to establish the temple when finished, and to sanction their proceeding. Afterwards the Greeks in Egypt, hearing that the chief temple of the Jews was called *Onion* or Onium, imagined that this name was derived from *onos*, signifying an ass; and hence they concluded that they had discovered the secret object of the Jewish worship. This notion was soon propagated; and it was asserted, that in the vestibule of every Jewish temple there was an ass's head. This fable was, in process of time, extended even to the Christians, and they were denominated *Asinarii*, and charged with having an ass's head in their churches, as an object of worship. As this temple was built in imitation of that at Jerusalem, it did not long survive it. Vespasian, it is said, gave orders for its destruction; though some writers defer the demolition of it to the time of Trajan: the temple upon mount Gerizim having been destroyed long before, probably when Hyrcanus took Samaria. See Bryant's Observations, &c. Diff. iii. p. 124, &c.

On the Beam, any distance from the ship; or the wind is said to blow, when on a line with the beams, or at right angles with the keel.

On the Bow, an arch of the horizon, comprehending four points of the compass on each side of that point to which the ship's head is directed. Thus, seamen say, the ship in sight bears three points *on the starboard bow*, that is, three points towards the right hand from that part of the horizon which is right a-head.

On the Quarter. Suppose the wind at east, and a ship sailing right before the wind, she would have the wind quartering from north-west to south-west, for at those two points the wind would be on the starboard or larboard quarter, according to what tack the ship was on. See *ON the Bow*.

ON-Stand, in *Agriculture*, a provincial term applied to the rent paid by the out-going to the in-coming tenant, for such portions of ground as the former has rightly cropped before his leaving the farm.

ONA, in *Geography*, a river of Russia, which runs into the Uda at Mongalova, in the government of Irkutsk.—Also, a town of Peru, in the diocese of Lima; 35 miles N.N.E. of Loxa.

ONABAS, a town of New Mexico, in the province of Hiagui; 16 miles N. of Riochico.

ONAGER, in *Zoology*, the name given by authors to the wild ass, a creature common in Syria, and some other places, and differing very little more from the common ass, than as creatures in their native wildness do from those of the same species kept in stables, and brought up to be domestic animals. The skin of this creature is very robust and durable, and makes the common shagreen leather used by

our case-makers, &c. its surface being rough with small tubercles. See *ASINUS*.

ONAGRA, in *Botany*. See *JUSSIEUA* and *CENOTHERA*.

ONAGRÆ, the 38th natural order in Jussieu's system, or the 6th of his 14th class, is so called from *Onagra*, the Tournefortian name of the Evening Primrose. (See *CENOTHERA*.) For the characters of this class see *FICOIDÆ*. The *Onagræ* are ranged next to the order last mentioned, and characterised as follows.

Calyx of one leaf, tubular, superior; its limb divided, and either permanent or deciduous. *Petals* definite in number, inserted into the upper part of the calyx, alternate with its segments. *Stamens* definite, inserted into the same part, either equal in number to the petals, or twice as many, rarely more. *Germen* simple, inferior; style generally one; stigma either simple or divided. *Fruit* capsular or pulpy, inferior, rarely but half inferior, mostly of many cells, with numerous seeds, rarely of one cell only; sometimes crowned with the limb of the calyx; sometimes, from the falling off of that part, naked at the summit. *Coraculum* without albumen. *Stem* either herbaceous or shrubby. *Leaves* alternate or opposite.

Section 1. Style manifold. Intermediate genera between the *Onagræ* and *Ficoideæ*.—Here Jussieu places his *Mocanera* (*Visnea* of Linn. Suppl.); *Vahlia* of Thunberg (see *OLDENLANDIA*); and *Cercodes* of Solander, which is *Haloragis* of Schreber.

Sec. 2. Style one. Fruit capsular. Stamens equal in number to the petals.—This section consists of *Montinia*, *Serpicula*, *Circea*, and *Ludwigia*.

Sec. 3. Style one. Fruit capsular. Stamens twice as many as the petals.—*Jussiaea*, *Cenothera*, *Epilobium*, *Gaura*, *Cacoucia*, Aubl. t. 179, *Combretum* and *Guiera*.

Sec. 4. Style one. Fruit pulpy.—Genera akin to the *Myrti*, but differing in the definite number of their stamens.—These are *Fuchsia*, *Petaloma* (*Mouriria* of Aublet), *Ophira*, *Backea*, *Memecylon*, *Jambolifera*, *Escallonia*, *Sirium*, and *Santalum*.

Sec. 5. Genera akin to the *Onagræ*, but polyandrous *Mentzelia* and *Loofa* (or *Loofa*).

The learned author of this order has made many subsequent remarks and corrections respecting it, in the *Annales du Museum d'Hist. Nat.* v. 3. 315, where he terms it, according to a new plan of nomenclature, *Onagrariæ*. His paper is translated in Dr. Sims and Mr. König's *Annals of Botany*, v. 1. 530.—Jussieu here adds to the second section *Trapa* and *Lopezia*. He proposes to remove from the fourth *Escallonia*, *Petaloma*, and *Backea*, and speaks doubtfully of *Jambolifera*, as not understanding the various characters given of the latter by authors, because they have described different things under that name.—As to the first section mentioned above, he would remove *Mocanera* or *Visnea* to his *Guaiacaneæ*; and expresses just doubts concerning *Vahlia*. He rightly refers *Proserpinaca* with *Myriophyllum* to the neighbourhood of *Cercodia* or *Haloragis*.

It is proper to observe that what Jussieu, in this essay, terms the first section, is, in his *Gen. Pl.*, as above, the third. This he says is the richest in genera, and he proposes to make no alteration therein, nor any addition thereto. It is in reality the clearest in character and habit of the whole, comprizing the real *Onagræ*, all most naturally allied in structure and habit to each other. See the various genera in their proper places.

ONANCOCK, in *Geography*, a town of America, in the state of Virginia. N. lat. 37° 45'. W. long. 75° 40'.

ONANG-SIÜEN, a town of Corea; 40 miles S.S.W. of Kang.

ONANIA, and *ONANISM*, terms which some late empirics have framed to denote the crime of self-pollution, mentioned in scripture to have been practised by Onan, and punished in him with death. Some take it for the same with what in other places of scripture, particularly Levit. ch. xx. is called *giving of seed to Moloch*; for which the punishment allotted is stoning to death.

This is but ill warranted; the ablest critics make them quite different things. Selden is positive the Jews, in imitation of their neighbours, actually sacrificed their children to Moloch. Others fancy they only made them pass between two fires, in order to obtain the idol's favour and protection. See *MOLOCH*.

ONANO, in *Geography*, a town of Italy, in the Patrimonia; five miles S. of Aquapendente.

ONANS, a town of France, in the department of the Doubs; 12 miles N.W. of Blamont.

ONAPA, a town of New Mexico, in the province of Hiaqui; 40 miles N.N.E. of Riochico.

ONAS, a town of Japan, in the island of Ximo; 22 miles S. of Funai.

ONATE, a town of Spain, in Guipuscoa; 22 miles N.E. of Vittoria.

ONCA, in *Zoology*, a species of the *felis*, in the Linnæan system. See *FELIS*.

ONCHA, in *Geography*, a town of Hindoostan, in the circar of Gohud; 18 miles S. of Bandera.

ONCHIDIUM, *ONCUM*, in *Zoology*, a genus of the Vermes Mollusca class and order; of which the generic character is as follows: Body oblong, creeping, flat beneath; mouth placed before; two feelers, situate above the mouth; it has two arms, at the sides of the head; the vent is behind, and placed beneath.

There is only one species, *viz.*

TYPHÆ. This is fully described in the fifth volume of the Linnæan Transactions. It inhabits Bengal, on the leaves of the *Typha elephantina*; it is about an inch long, and three quarters of an inch broad, but linear and longer when creeping. In appearance it resembles a limax, but differs principally in wanting the shield and lateral pore, and in being furnished with a vent behind. The body above is convex, ash-colour, and covered with irregular glandular tubercles; beneath it is flat and smooth; the head is yellowish, small, and placed beneath, which, when the animal is in motion, is perpetually changing its form and size, and drawn in when at rest; the mouth is placed lengthways, and is continually varying in its shape, from circular to linear; the feelers are retractile, resembling those of the slug, and apparently tipped with eyes; the arms are dilatible, solid, compressed, and somewhat palmate, when fully expanded.

ONCIDIUM, in *Botany*, so named by professor Swartz, according to his own account, from *ονκιδιον*, a *tubercle*, in allusion to a couple of prominences on the lip. His figure represents one of these as forming so perfect a hook, that we presume he had in view also that sense of the word *ονκος*.—Swartz. Act. Holm. for 1800. 239 t. 3. f. 2. Orchid. 77. t. 1. f. 2. Traacts on Botany, 180. t. 5. Willd. Sp. Pl. v. 4. 112.—Class and order, *Gynandria Monandria*. Nat. Ord. *Orchideæ*, Linn. Juss.

Gen. Ch. Cal. Perianth of three, rarely but two, stalked leaves. Cor. Petals two, larger than the calyx, somewhat wavy. Nectary a lip spreading from the base of the style, lobed; the central lobe large, with two prominences on the upper side of its disk. Stam. Anther a roundish deciduous lid, of two cells, between the wings of the style; masses of pollen globular, in pairs, joined by a common stalk. *Pist.* Germen inferior, slender, nearly cylindrical; style erect, excavated

excavated in front, with two marginal wings at the summit; stigma concave, beneath the anther. *Peric.* Capsule oblong, slender, of one cell, opening between the ribs. *Seeds* numerous, minute, tunicated.

Eff. Ch. Calyx and petals spreading. Lip flat, with tubercles near the base. Anther a deciduous lid, between the wings of the style.

Obf. This handsome genus is remarkable for the singular lobed form of the flower, and the paniced inflorescence. All the known species are natives of the West Indies.

1. *O. carthagenense*. Willd. n. 1. Sw. Ind. Occ. 1479. (*Epidendrum carthagenense*; Jacq. Amer. 228. t. 133. f. 4. Pi&t. 111. t. 214. *E. undulatum*; Sw. Prodr. 122. Curt. Mag. t. 777. *Viscum radice bulbosâ majus et elatius*, delphinii flore ferrugineo guttato; Sloane Jam. v. 1. 250. t. 148. f. 1.)—Stem none. Leaves elliptical, flattish, fleshy. Stalk radical, much branched. Petals roundish, with claws. Lip crenate.—This grows on trunks and large arms of trees in Jamaica. It flowered in May 1804, in Mr. Woodford's collection at Vauxhall. The root consists of many thick fibres. *Leaves* a foot long, compared by Sloane to those of the common White Lily. *Stalk* three to six feet high, much branched above, the ultimate branches bearing several large, alternate, nearly sessile flowers towards their extremities. The calyx and petals are somewhat spatulate, whitish or yellow, variegated with rusty brown and purple; the latter larger, paler, more wavy, and veiny. *Lip* of the same colours, with a small violet-coloured disk.—Swartz in his *Flora* puts a mark of doubt to the synonym of Jacquin. The colours of the flowers in the Bot. Mag. are more lurid, and apparently more natural than in Jacquin's figure.

2. *O. altissimum*. Willd. n. 2. Swartz. Ind. Occ. 1481. (*Epidendrum altissimum*; Jacq. Amer. 229. t. 141. Pi&t. 112. t. 215.)—Stem none. Leaves elliptic-lanceolate, bulbous at the base. Flowers in a long compound cluster. Calyx and petals lanceolate. Lip emarginate.—Parasitical on the trunks of trees, in Jamaica and other West Indian islands. The leaves proceed each from a large oval furrowed bulb, and are about a foot long. *Flower-stalks* radical, solitary, bearing a compound cluster, three or four feet in length, and more or less pendulous. *Flowers* yellow, spotted with brown, their calyx-leaves and petals sessile, more lanceolate and less undulated than in the former. *Lip* inversely heart-shaped, convex, emarginate, not undulated.

3. *G. tetrapetalum*. Willd. n. 3. Swartz. A&t. Holm. 240. (*Epidendrum tetrapetalum*; Jacq. Amer. 230. t. 142. Pi&t. 112. t. 216.)—Stem none. Leaves awl-shaped, keeled. Flowers in a simple cluster. Calyx-leaves ovate, wavy. Lip stalked, kidney-shaped.—Native of woods in Jamaica. We know this species only from the publications of Jacquin, who represents the flowers as purplish, fragrant, without petals (as we call them); for he describes the lip and three calyx-leaves as composing a flower of four petals. The cluster is short and simple, growing on a radical stalk about a foot high. *Leaves* several, three or four inches long, not half an inch wide.

4. *O. variegatum*. Willd. n. 4. Swartz. Ind. Occ. 1483. (*Viscum delphinii flore albo guttato minus, radice fibrosâ*; Sloane Jam. v. 1. 251. t. 148. f. 2.)—Stem none. Leaves lanceolate, channelled, recurved, with cartilaginous ferratures. Cluster short. Lip two-lobed. Parasitical on trees in the mountainous parts of the West Indies.—It has the habit of the last, and like that seems to want real petals. The lip and calyx are white, spotted with red, according to Swartz, who says the beautiful flowers appear in April.

5. *O. Ceboletta*. Willd. n. 5. Swartz. A&t. Holm. 240. (*Epidendrum Ceboletta*; Jacq. Amer. 230. t. 131.

f. 2. Pi&t. 112. t. 217.)—Stem none. Leaves cylindrical awl-shaped, bulbous at the base. Cluster compound, pendulous.—Native of woods, especially near the sea, at Carthage. Jacq.—The roots creep on the branches of trees, bearing a crowd of little green bulbs, the size of hazel-nuts, each producing an erect leaf, not unlike that of a young onion, about a foot high. *Stalk* slender, much longer than the leaves, drooping, crowned by a shortish compound pendulous cluster, which Jacquin saw in fruit only.

ONCINO, in *Geography*, a town of France, in the department of the Stura, on the Po; 14 miles W. of Saluzzo.

ONCOBA, in *Botany*, a genus of Forskal's, so called from its Arabian name *Oncob*. Fork. Ægypt-Arab. 103. Gmel. Syst. Nat. v. 2. 828. Juss. 292. Lamarck Dict. v. 6. 210. Illustr. t. 471.—Class and order, *Polyandria Monogynia*. Nat. Ord. *Tiliaceæ*, Juss.

Gen. Ch. Cal. Perianth inferior, of one leaf, permanent, divided into four, deep, concave, obtuse segments. Cor. Petals eleven or twelve, spreading, toothed; the outer ones longer than the calyx; the inner smaller, unequal. Stam. Filaments numerous, thread-shaped, erect, inserted into the calyx; anthers erect, simple, linear. Pist. Germen superior, globose, longitudinally furrowed; style cylindrical, longer and thicker than the filaments; stigma orbicular, furrowed, seven-lobed. *Peric.* Berry globular, pulpy, of one cell, and many oblong, compressed seeds.

Eff. Ch. Calyx of one leaf. Petals numerous. Berry of one cell, many-seeded.

1. *O. spinosa*. Gmel. Syst. Nat. v. 2. 828.—Native of Egypt and Senegal, where it is called, according to Adanson's herbarium, *Dimb*, or *Rimbot*. This is the only species known, being rather a lofty tree, with alternate, warty branches, each furnished with one or two spines about two inches long. *Leaves* alternate, shortly stalked, ovate, pointed, serrated, smooth. *Flowers* solitary, large, white. *Calyx* white internally. The berries are said by Forskal to be eaten by children.

ONCOS, *ὄσκος*, in *Antiquity*, was used to signify an ornament of the head, peculiar to those who offered sacrifice.

ONDA, in *Geography*. See *St. VINCENT de la Paz*.
ONDARROA, a town of Spain, in Biscay; eight miles W. of St. Sebastian.

ONDATRA, in *Zoology*. See *Mus Zibeticus*.
ONDEE, in *Heraldry*. See *WAVED*.

ONDEGGIARE, in the *Italian Music*, signifies to return the hand beating time, not directly, but by degrees; as *ondeggiare la mano*, to keep it waving in the air, or giving it two motions, before it is quite lifted up to end the bar, and thence to fall it to beat a first, second, or third time, of that or another measure.

The Italians do not beat time merely by the two motions of *down* and *up*; but mark, by waving the hand, every portion of a bar. Suppose, for instance, a movement in common time of four crotchets in a bar, two accented and two unaccented: to the first accent the hand is beaten down; for the second portion of the bar it is waved to the right; for the third to the left; and for the fourth and last part of a bar it is lifted up vertically, and comes down for the first note of the next bar, &c. In triple time of three portions, the hand comes down for the first, is waved to the right for the second, and for the third lifted perpendicular.

ONDER BOKKEVELD, in *Geography*, a territory of Southern Africa, being one of the transmontane divisions of Stellenbosch near the Cape of Good Hope. This is the elevated flat surface of a table mountain, whose sides on the W. and

W. and N. are high and almost perpendicular rocks, piled on each other in horizontal strata like those of Table mountain at the Cape, but it descends with a gentle slope to the eastward, and terminates in Karroo plains. The grasses on the summit are short but sweet, and the small shrubby plants are excellent food for sheep and goats. The horries are among the best which the colony produces, and the cattle thrive well. In some of the valleys, where the grounds admit of vegetation, the common returns of wheat are 40, and of barley 60, for one, without any rest for 20 years, without fallowing, and without manure. The soil is deeply tinged with iron, and abounds with masses of iron-stone. Barrow's Travels in Southern Africa, vol. ii.

ONE-BERRY, in *Botany*. See *Herb PARIS*.

ONE-Blade. See *SMILAX*.

ONE-Wheel Plough. See *PLOUGH*.

ONEEHEOW, in *Geography*, one of the Sandwich islands in the N. Pacific ocean, lying five leagues to the westward of Atooi, and not above fifteen leagues in circuit. The eastern coast is high and rises abruptly from the sea, but the rest of the island consists of low ground; excepting a round bluff head in the S.E. point, which terminates in a round hill. It produces abundance of yams, and of the sweet root called "Tee." Here is salt, which the natives call "Patai," and is produced in salt ponds. With this they cure both fish and pork; and their salt fish kept very well, and was found to be very good. When captain Cook visited this island in January 1778, six or seven canoes came off with some small pigs and potatoes, and a good many yams and mats. The people resembled those of Atooi, and seemed to be equally acquainted with the use of iron, which they asked for by the names of "Hamaite" and "Toe," parting readily with all their commodities for pieces of this precious metal. Many of them came readily on board, crouching down upon the deck, and not quitting this humble posture till they were desired to get up. The women, who were left in the canoes, behaved with much less modesty than those of Atooi, and at times all of them joined in a song, not remarkable for its melody, though performed in very exact concert, by beating time upon their breasts with their hands. It appears certain, that the horrid banquet of human flesh is as much relished here, amidst plenty, as it is in New Zealand. Some of the people, in answer to questions put to them on this subject, replied without hesitation, that if their navigators were killed on shore, they would certainly eat them. Their meaning plainly seemed to be, that they would not destroy them for the sake of eating them, but that their eating of them would be the consequence of previous enmity. One of the men had punctured on his breast the figure of a lizard, and upon those of others were the figures of men badly imitated. This island had no chief or "hairee," but was subject to Teneoonao, a chief of Atooi. The soil of this island was found to be very poor and stony; but it was covered with shrubs and plants of more delicious fragrance than any which occurred in any other islands visited in this ocean. There was no appearance of any running stream; but some small wells were found, in which the fresh water, which was scarce, was tolerably good. The habitations of the natives were thinly scattered about; and it was supposed that there could not be more than 500 people upon the island. Their mode of living seemed to be decent and cleanly; but the men and women were not observed to eat together, and the latter seemed to associate in companies by themselves. It was found that they burnt here the oily nuts of the "dooe dooe" for light in the night, as at Otaheite; and that they baked their hogs in ovens; but, contrary to the practice of the Society and Friendly islands, they split the carcases

through their whole length. The "taboo," or as they called it, "tapoo," was found to exist in this island, for one woman fed another who was under that interdiction. They also observed some other mysterious ceremonies. A particular veneration seemed to be paid here to owls, which are very tame; and it was observed to be a pretty general practice among them to pull out one of their teeth, in which they agreed with Dampier's natives on the W. side of New Holland, although at such an immense distance; for this practice the only reason they assigned was, that it was "teeha," which is the reason given for another of their practices, the giving a lock of their hair. Cook's Third Voyage, vols. ii. iii. N. lat. $21^{\circ} 50'$. E. long. $199^{\circ} 45'$.

ONEG, a town of Russia, in the government of Archangel, on the river Onega, near the White sea; 80 miles S.S.W. of Archangel. N. lat. $63^{\circ} 35'$. E. long. $37^{\circ} 24'$.

ONEGA, a river of Russia, which rises in the N.W. part of the government of Volgda, and runs into the White sea.—Also, a lake of Russia, in the government of Olonetz, between the Ladoga and the White sea. The length is between 180 and 200 versts, and its breadth from 60 to 80. Like the Ladoga it contains a few islands consisting of marble, and in all other properties is much the same. As from the Onega the navigable river Svir runs into the Ladoga, and from the Bielo-Ozero the Shaksna flows into the Volga, a canal cut through the distance of 40 versts would connect the Neva with the Volga, and afford a more convenient navigation than the passage by Vishnoi-Volotshok, because there are no water-falls, and therefore all the danger and trouble attending them in the present passage would be obviated. Tooke's Russ. vol. i.

ONEGLIA, or ONEILLA, a sea-port and capital of a principality, on the coast of the Mediterranean, which carries on a considerable trade in olive-oil. It is well built, and had formerly a large and good citadel, which has been destroyed. In October 1792 the French attacked it both by land and sea, and having taken it by storm, surrendered it to a general plunder, and afterwards set fire to it in several places; 30 miles N.E. of Nice. N. lat. $43^{\circ} 55'$. E. long. $8^{\circ} 4'$.—Also, a principality surrounded on all sides, except towards the sea, by the territory of the Genoese. It consists of three vallies, viz. Oneglia, Maro, and Prela. The first is covered with fruit-trees, intermixed with houses, so as to have the appearance of a continued orchard. Maro, or Mairo, extends from the village of St. Lazara to the col of St. Bernard, where it joins the valley of Piéva, in the jurisdiction of the Genoese. The third valley of Pierrelata, or Prela, lies to the W. of the other two. All these vallies extend 19 miles from the sea, and in them are reckoned 53 towns or villages, 3000 families, 14,000 inhabitants, and 2000 men fit to bear arms. The country produces wines, fruits, and excellent olive-oil. The capital is Oneglia.

ONEIDA, a county of New York, bounded N.E. and E. by Herkemer county, S.E. by Otsego county, S. by Oneida lake and Chenango, and W. by lake Ontario. This county, 90 miles from N. to S. and from 40 to 60 from E. to W., is well watered and the soil is fertile. The number of inhabitants is 22,047.

ONEIDA Creek, a river of New York, which runs into lake Oneida. N. lat. $49^{\circ} 3'$. W. long. $75^{\circ} 47'$.

ONEIDA Lake, a lake of America, in the state of New York, between 20 and 30 miles long, and five miles wide; it is connected with lake Ontario on the W. by Oswego river, and with fort Stanwix by Wood creek.

ONEIDAS, one of the Six Nations of Indians, containing 628 persons, who inhabit the country S. of Oneida lake, called the Oneida Reservation. Their principal village,

Kahaomerolakala is about 20 miles S.W. of Whitestown. This nation receives an annuity from the state of New York of 3552 dollars for lands purchased of them in 1795, and an annuity of about 628 dollars from the United States. These annuities, together with the corn, beans, and potatoes, raised by the squaws, and the fish and game caught by the men, afford them a barely tolerable subsistence. Their pride leads them to despise their neighbours, the Stockbridge and Brotherton Indians, for their attention to agriculture; but being under a necessity of purchasing provisions of them, they begin to feel a sense of their dependence. They are divided into three tribes, or clans, by the names of the Wolf, the Bear, and the Turtle. They have their name from their Pagan deity; which some few of the natives still worship, notwithstanding the instruction of missionaries from the society established in Scotland for promoting Christian knowledge; which deity is merely a mis-shapen, rude, cylindrical stone, about 120 pounds in weight, in their language called "Oneida," signifying the "Upright Stone." Formerly this stone was placed in the crutch of a tree, and then the nation supposed itself invincible. These Indians are all of mixed blood; inasmuch, that there has not been a pure Oneida for several years past.

ONEIROCRITICA, *ονειροκριτική*, the art of interpreting dreams, or a method of foretelling future events, by means of dreams.

The word is formed from the Greek, *ονειρος*, dream, and *κριτική*, of *κρίσις*, judgment. Some call it *oneirocratia*, and derive it from *ονειρος*, and *κρατεω*, I possess, I command. It appears from several passages of scripture, that there was, under the Jewish dispensation, such a thing as foretelling future events by dreams; but then there was a particular gift, or revelation, required for that purpose.

It should seem, hence, that dreams are really significative, and do forebode something to come; and all that is wanting among us is the oneirocritica, or the art of knowing what: yet it is the opinion of many, that dreams are mere chimeras; bearing, indeed, some relation to what has passed, but none to what is to come. As to the case of Joseph, it was possible for God, who knew all things, to discover to him what was in the womb of fate; and, to introduce that, he might take the occasion of a dream; not but that he might as well have foretold it from any other accident or circumstance whatever: unless God, to give the matter more weight, should purposely communicate such a dream to Pharaoh, in order to fall in with the popular notion of dreams and divination, which then prevailed among the Egyptians. See DREAM.

ONEIROCRITICS, formed from *ονειρος*, dream, and *κρίσις*, judgment, a title given to interpreters of dreams, or those who judge of events from the circumstances of dreams.

There is no great regard to be had to those Greek books called oneirocritics; nor do we, indeed, know why the patriarch of Constantinople, and others, should amuse themselves with writing on so mean a subject.

Rigault has given us a collection of the Greek and Latin works of this kind; one attributed to Astrampichus; another to Nicephorus, patriarch of Constantinople; to which are added, the treatises of Artimedorus and Achmet. But the books themselves are little less but reveries; a kind of waking dreams, to explain and account for sleeping ones.

The secret of oneirocriticism, according to them all, consists in the relation supposed to be between the dream and the thing signified; but they are far from keeping to the relations of agreement and similitude; and frequently they have recourse to others, of dissimilitude and contrariety.

ONEIROPOLI, *ονειροπολις*, or *Oneiroscopi*, in Antiquity, persons whose business it was to make predictions from dreams.

ONEMACK POINT, in Geography, the S.W. point of the continent of North America, on the N.W. coast, and the S. limit of Bristol bay; 82 leagues S.S.W. of cape Newenham, on the N. point of that extensive bay. N. lat. 54° 30'. W. long. 163° 30'.

ONEMENSKAIA, a lake of Russia, in the river Anadyr; 208 miles below Anadyrskoi, communicating with the gulf of Anadyr.

ONERANDO *Pro Rata Portionis*, in Law, a writ which lies for a joint-tenant, or tenant in common, when distrained for more rent than the proportion of his land comes to.

ONESON, in Geography, a town of Nubia, on the left bank of the Nile; 30 miles N.E. of Sennaar.

ONEVI, one of the smaller Friendly islands, in the South Pacific ocean, near the N. coast of Tongataboo; 5 miles N.E. of Observatory Point.

ONEZSKOE, a lake of Russia, in the government of Olonetz; 120 miles long, and about 40 at its medial breadth; containing several islands. N. lat. 61° to 67°. E. long. 29° to 31°.

ONFZANI, a town of European Turkey, in Moldavia; 31 miles N.N.E. of Saffi.

ONGAR, or CHIPPING-ONGAR, a market-town and parish in the hundred of Ongar, and county of Essex, England, is situated at the distance of 10 miles W. by S. from Chelmsford, and 21 miles N.E. from London. The town is supposed to be of great antiquity, and to have been of considerable importance, first under the Romans, and subsequently under the Saxons and Normans. After the conquest, a strong castle was erected here by Richard de Lucy, who was chief justice of England in the reign of Henry II. A high mount, called the Keep, and some other remains of this fortress, are still visible on the east side of the town; and from their extent and magnitude would induce the belief of the castle having been formed out of a fortification of still greater antiquity and dimensions. A wide and deep moat, commonly filled with water, surrounds the keep. A steep winding walk, now shaded with a thick plantation of trees and shrubs, leads to the summit.

Chipping-Ongar is now only a trifling place, and consists of one long and wide street. The church, a small structure, is remarkable for the castellated loop-hole appearance of its windows. Within the church is a monument in honour of Jane, daughter of lord Oliver Cromwell of Hinchinbrooke, in Huntingdonshire. The market-day in this town is Saturday weekly, and there are two fairs every year. According to the parliamentary returns of 1811, the whole parish contained 120 houses, and 678 inhabitants.

About a mile from Ongar stands the village of Greensted, which particularly deserves notice on account of its church. This is regarded by antiquaries as one of the most ancient and curious specimens of architecture in our island. The nave is entirely composed of the trunks of oak trees, split or sawn asunder, and fixed upright in a fill and plate, close to each other. "On the south side are sixteen, and two door-posts; on the north twenty-one, and two vacancies, filled up with plaster. The west end is built against by a boarded tower; and the east by a chancel of brick; on the south side is a wooden porch, and both sides are strengthened by thick buttresses: the roof is of later date, and tiled." The total length of the wooden portion of the church is twenty-nine feet nine inches; the width fourteen feet; and the height, to the spring of the roof, five feet six inches.

According

According to tradition, this edifice was erected as a temporary shrine for the corpse of one of our ancient kings; and Smart Lethieullier, esq. states that the body of St. Edmund, when on the way to its place of sepulture at St. Edmund's Bury, was "entertained at Aungre (Ongar), where a wooden chapel erected to his memory remains to this day." Contiguous to the church is the seat of Craven Ord, esq. one of the masters in chancery.

At Fyfield, a mile north-east from Ongar, a variety of Celts were discovered in 1749: and near Navestock, a feat of the earl of Waldegrave, is an ancient monument, supposed by Stukeley to be a Druid temple of the kind which he called Alate.

Otes, four miles to the north of this town, was the seat of the lords Mashams, and distinguished as the retreat of the celebrated John Locke, who died here in 1704, and lies buried under a plain altar in the village church-yard, having an inscription upon it from his own pen. Camden's Britannia by Gough, vol. ii. folio. Beauties of England and Wales, vol. v. by E. W. Brayley, and John Britton, F. S. A.

ONGERCURRY, a town of Hindoostan, in the province of Cattaik; 22 miles E. of Guntoor.

ONG-KIN, a town of Corea; 58 miles S.W. of Hoang.

ONG-LAKE, a river of Madagascar, which runs into the bay of St. Augustine.

ONGLEE, or ONGLE, is used by the French heralds to denote the talons or claws of beasts or birds, when of colours different from the body.

ONGLET, in *Ornithology*. See *TANAGRA Striata*.

ONGOA, in *Geography*, a town of Africa, in the country of Mocaranga; 80 miles N.W. of Massapa.

ONGOBOLU, one of the smaller Friendly islands; 6 miles E. of Neneeva.

ONGOLE, a circar of Hindoostan, in the Carnatic, E. of Cuddapa, and S. of Guntoor.—Also, the capital of the above circar, situated in the northern part of the Carnatic; 65 miles N. of Nellore. N. lat. $15^{\circ} 30'$. E. long. $78^{\circ} 58'$.

ONGO-MANCAN, a town of Chinese Tartary. N. lat. $43^{\circ} 32'$. E. long. $121^{\circ} 22'$.

ONI, a town of Imiretta; 65 miles N.E. of Cotatis.

ONIDA, a small island in the gulf of Venice. S. lat. $44^{\circ} 42'$. E. long. $14^{\circ} 47'$.

O-NIMAMOU, a harbour on the S.E. coast of the island of Ulitea; N.E. of Ohetuna, a harbour on the same coast.

ONION, CAPE, a cape on the S.W. side of Newfoundland island, about four leagues W. of Quirpon island, or the northern point of that extensive island.

ONION River, a river of America, in the state of Vermont, formerly called "French River," and by the Indians "Winooski," which rises in Cabot, about 14 miles W. of Connecticut river, and is navigable for small vessels five miles from its mouth, in lake Champlain, between the towns of Burlington and Colchester, and for boats between its several falls. This is said to be one of the finest streams in Vermont; and it runs through a very fertile country, the produce of which, for some miles on each side of the river, is brought down to the lake at Burlington. It is from 20 to 30 rods wide, to the lower falls, and 15 or 20 rods, 40 miles from its mouth, and its descent in this interval is 172 feet, or about four feet *per* mile. Between Burlington and Colchester it has forced a passage through a solid rock of lime-stone, which at some remote period must have formed at this place a prodigious cataract. The chasm is between

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70 and 80 feet in depth at low water, and in one place 70 feet from rock to rock, where it is traversed by a wooden bridge. At Bolton there is a chasm of the same kind, and the rock is at least 130 feet high. From one side several rocks have fallen across the river, so as to form a natural bridge at low water, but in a situation that renders it merely an object of curiosity. The Indians formerly passed along this river from Canada, when they made their attacks on the frontier settlements, on Connecticut river. Morse.

ONJONG-MASSANG, a town on the W. coast of Sumatra, on the Line. E. long. $99^{\circ} 21'$.

ONIONS, in *Botany*, *Gardening*, *Dietetics*, and the *Materia Medica*. See ALLIUM.

ONIONS, *Sea*. See SQUILL.

ONION-Shell, in *Natural History*, a name given by authors to a peculiar kind of oyster, which is of a roundish figure and very thin and transparent, and represents very exactly a piece of the peel of an onion. See OSTREA.

ONIS, in *Geography*, a town of Spain, in Asturias, situated E. of Cangas de Onis, at the foot of a mountain, and upon the little river Curado.

ONIS, *Cangas de*, a town of Spain, in Asturias, situated at the confluence of two rivers, one of which, the Sella, is crossed by a beautiful bridge of one arch. This town has the freedom of a municipal administration. This and the last-mentioned town lie in the road from Oviedo to Santa Cruz.

ONISCUS, in *Ichthyology*, a name given by Athenæus, and others of the Greek writers, to the acipenser, or sturgeon.

ONISCUS is also the official name of the whiting. See *GADUS Merlangus*.

ONISCUS, in *Entomology*, a genus of insects of the order Aptera; of which the generic character is: Jaw truncate, denticulate; lip bifid; the antennæ are setaceous, and are from two to four in number; the body is oval, consisting of about fourteen transverse segments; and it has fourteen legs. There are forty-three species, separated into two sections. They all feed on animal and vegetable matter, and cast their skin. The sea onisci are larger than those of the fresh water, having ten instead of seven segments. Their motions in the water are rapid, for besides the feet, they are assisted by lateral threads, which push them forward like the oars of a boat. Among them, the act of copulation is said to last several days; when the male seizes his female with his two fore-feet, and drags her along with him wherever he directs his course. On the seventh day after impregnation the young issue from the mother alive, and swim about with vigour and alertness. The sea onisci are supposed to be viviparous; those of the land oviparous: the former are of a pale red colour for some time after being excluded from the shell.

Division A. These have no feelers; they have frequently four antennæ, that are sessile. This division comprises the Cymothoa of Fabricius, and contains thirty-eight species, of which ten, as will be marked in the description, are common to our own country.

Species.

PARADOXUS. This species has the segments of the body falcate and spinous. It is found in Terra del Fuego, and is a large insect.

IMBRICATUS. Antennæ compressed; legs furnished with claws; hind-thighs carinate. It inhabits New Zealand; it is large, oblong, and pale.

FALCATUS. The segments of the body of this are falcate.

cate and two-spined at the sides. It inhabits the Chinese ocean.

* **ASILUS**. Abdomen covered with two scales; the tail is semi-oval. It inhabits the European ocean.

GAUDALOUPENSIS. The abdomen of this insect is covered with six scales; the tail is ovate, entire. It inhabits the American ocean.

* **OESTRUM**. Abdomen covered with six scales; the tail retuse. It is found in European seas.

* **ENTOMON**. Abdomen naked beneath; tail oblong, acute. It inhabits the European ocean, and preys on small fish.

* **AQUATICUS**. The tail is rounded, with forked styles; it has four antennæ. This is found in stagnant waters in many parts of Europe. The young are contained in a six-cleft follicle.

* **MARINUS**. Semi-cylindrical; tail oval-oblong, pointed. It inhabits the European seas.

* **LINEARIS**. Body linear; tail four-toothed. It inhabits the European and Indian seas.

CHELIPES. Oblong; tail three-toothed; legs slightly chelate. It is found in the Atlantic among sea-weed.

BICAUDATUS. Semi-cylindrical, with two tails as long as the body. It inhabits the seas of Norway.

SCOPULORUM. Body pale yellow with brown streaks. Inhabits the seas of Norway.

AMERICANUS. Abdomen covered with twelve scales; hind-legs long and rufous; tail rounded. It inhabits the American ocean.

PSORA. Abdomen naked beneath; tail semi-oval, acute. It inhabits Norway.

* **PHYODES**. Abdomen naked beneath; tail ovate. It inhabits Europe.

* **BIDENTATUS**. Abdomen naked; tail very obtuse, the last scale two-toothed. In this the body is very minute, and marked on the upper side with six transverse rows of ochreous spots; the scales are even, the last with two teeth.

SPINOSUS. Body oblong, spinous and pellucid. It is found in the Atlantic ocean; the body is gelatinous.

ACUMINATUS. Oblong, grey; antennæ and legs paler; tail pointed. It inhabits the ocean.

EMARGINATUS. This is oblong and of a grey-brown; the tail is emarginate. It inhabits the ocean.

ALBICORNIS. Oblong, brown; tail pale, dotted with black. It inhabits the Spanish seas.

CETI. Ovate, with distinct segments; third and fourth pair of legs linear and unarmed. It inhabits the northern seas, and infests the whale; hence its specific name.

* **OCEANICUS**. Ovate; tail ending in two bifid styles. It inhabits the European ocean.

SERRATUS. Ovate, brown; tail with five plates; the outer ones serrate without. It inhabits the Spanish coast, and is small.

* **ASSIMILIS**. Ovate; tail obtuse, unarmed; body cinereous. It inhabits Europe.

CORALLINUS. Lanceolate; above brown; tail oblong-triangular, and crenate.

ACULEATUS. The thorax is naked; the back is beset with three rows of spines. It is found in the White sea.

SCORPIOIDES. Thorax oval-globular; tail long, jointed, ending in a spine and bifid bristles. This also is an inhabitant of the White sea; as is the next.

CUSPIDATUS. Thorax articulate, tuberculate; the six dorsal segments cuspidate.

HECTICUS. Cinereous, linear; tail linear, bicuspidate,

with two linear styles. It is an inhabitant of the Atlantic.

TINEA. Ovate; green spotted with black; the tail is rounded. It inhabits Denmark.

TRIDENTATUS. This is flattish; the tail is composed of two plates, and is three-toothed. It inhabits Denmark.

FUSCUS. This is of a brown colour; the shell is carinate with a white spot on the thorax. It is also found in Denmark.

CICADA. A little compressed, sublinear, with four spurious bands; the upper antennæ shorter; tail smooth on the back. It inhabits the Greenland seas.

MEDUSARUM. Compressed; front obtuse; antennæ very short and pendent; four hands compressed and cut. It is found under the folds of the Medusa capillata.

ARENARIUS. This is slightly depressed before, carinate and subferrate behind; it has four fore-legs cheliform and smooth; the antennæ are nearly equal.

STROMBIANUS. Compressed; four fore-legs cheliform and slightly toothed; the upper antennæ very short. It inhabits the shores of Greenland: the body is of a violet colour.

ABYSSINUS. Sub-cylindrical; it has four fore-legs cheliform and one-toothed; the antennæ are subequal, fetiferous and ferrate at the base on the inner margin. It inhabits Greenland: the body is marked with white and saffron bands: it darts with great velocity in the water.

Division B contains five species, of which two are common to our own country. They have unequal feelers, the hind ones longer; antennæ filiform.

MACULATUS. Tail obtuse and unarmed; the body is of a lead colour, with dotted white lines. It is found in Italy, and is twice the size of the armadillo to be described presently; the body is marked with seven longitudinal white dotted lines.

PUSTULATUS. Black; with four red dots on the first segment, and two whitish ones on the rest. It inhabits southern Europe.

* **ASSELLUS**; the Wood-louse. Tail obtuse, with two simple styles. It is rather more than half an inch long; the colour is of a livid brown. It inhabits Europe in walls, rotten wood, and under stones; it preys on minute insects; it infests England and many other parts of Europe. The young are contained in a four-valved follicle under the abdomen of the mother.

SYLVESTRIS. Tail with four styles, the lateral ones longer. It inhabits France, and is less than the last.

* **ARMADILLO**; Millepede, or Medical Wood-louse. The body of this insect is of a grey-brown; the tail is obtuse and entire; the body consists of ten segments, the edges of which are white; it is longer than the assellus, of a darker colour, and a more polished surface; but found in similar situations: when suddenly disturbed or handled it rolls itself up into a completely globular form, in the manner of the armadillo, hence its specific name. See **MILLEPEDES**.

ONISION, in *Geography*, a town of Persia, in the province of Irak; 20 miles N. of Confar.

ONKELOS, in *Biography*, a celebrated rabbi, who flourished in the first century, and was author of the Chaldee **TARGUM**, (which see,) or translation of the Pentateuch, which is called after his name. He was probably a contemporary with Jonathan Ben Uzziel, author of the Targum of the prophets, but by much the younger of the two. For according to the Jewish writers Jonathan was one of the principal scholars of Hillel, who died about the time of our Saviour's birth; while Onkelos survived Gamaliel,

liel, the master of St. Paul, who was grandson of Hillel, and who lived till within eighteen years of the destruction of Jerusalem. It is said that Onkelos assisted at the funeral of Gamaliel, and contributed largely to the expence of it. Our own historian, Prideaux, is of opinion, that Onkelos was of older standing than Jonathan, alleging, as one of the principal reasons for adopting it, the purity of style in which his Targum is written; for the nature of this argument we again refer to the article TARGUM. The first Latin version of this work was made by Alphonsus de Zamora, and published in the Complutensian edition of the Polyglot, in 1517, whence it was adopted into the Antwerp in 1572; into that of Le Jay at Paris, and also into our countryman Walton's, in 1657.

ONKOTOMY, formed from *ὄκος*, *tumour*, and *τεμνω*, *I cut*, in *Surgery*, the operation of opening a tumour or abscess.

ONNA, in *Geography*, a town of Thibet; 15 miles N.N.W. of Morou Conghé.

ONOA, or ONUBA, now *Moguer*, a town of Spain, in Bætica, towards the S.W. at the bottom of a small bay. Pliny places it at the confluence of the Luxia and the Unrium, and gives it the surname of "Æstuarium," indicating its being situated on the sea-coast, and thus distinguishing it from another *Onoba*, in the interior of the country, belonging to the Turduli.

ONOBRYCHIS, in *Botany*, is Tournefort's synonym for HEDYSARUM, see that article.

ONOCENTAURUS, a fabulous animal, supposed to be a compound of a man and an ass. Ælian speaks of onocentaurs. It was half man and half ass, as the centaur was half man and half horse. Lib. vii. cap. 9.

ONOCHORUS, in *Ancient Geography*, the name of one of the five principal rivers of Thessaly, according to Herodotus and Pliny.

ONOCLEA, in *Botany*, was so called by Linnæus, from *ὄνος*, *a sort of vessel*, and *κλειω*, *to shut up*. He appears to have taken the idea from Mitchell, who gave the name of *Angiopteris* to this fern; which being composed of *αγγειον*, *a vessel*, and *πτερις*, *a fern*, was justly, according to his rules, inadmissible, since another established genus was called *Pteris*. Both appellations allude to the apparent capsules, ranged in a two-ranked spike, but which are, in fact, formed of the closely inflexed lobes of the frond, concealing the real seed-vessels.—Linn. Gen. 559. Schreb. 756. Willd. Sp. Pl. v. 5. 287. Mart. Mill. Dict. v. 3. Juss. 15. Lamarck Illustr. t. 864. (Struthiopteris; Willd. Sp. Pl. v. 5. 288.)—Class and order, *Cryptogamia Filices*. Nat. Ord. *Filices dorsiferae annulatæ*.

Ess. Ch. Capsules covering the back of the frond. Involucrum from the closely reflexed marginal segments of the leaf.

Obs. At the suggestion of Mr. Brown in his Prodr. Nov. Holl. v. 1. 152, under *Stegania*, perfectly in unison with our own judgment, we combine the *Struthiopteris* of Willdenow with *Onoclea*, while we consider every thing else, that has been at any time referred to this genus, except our third species, as foreign to it. (See GLEICHENIA.) Most of the *Onoclea* of Swartz make a principal part of a new genus of Willdenow, *Lomaria*, Sp. Pl. v. 5. 289, and among them *Acrostichum spicatum*, Linn. Suppl. 444. Sm. Ic. ex Herb. Linn. t. 49. In *Lomaria* the involucrum is uninterrupted, proceeding in like manner from the inflexed edge of the leaf, and covering the continuous mass of capsules.

1. *O. sensibilis*. Linn. Sp. Pl. 1517. Swartz. Fil. 110.

Michaux Boreal-Amer. v. 2. 272. (*Filix mariana*, of *mundæ facie racemifera*; Pluk. Mant. 80. t. 404. f. 2. *Polypodium virginianum*, of *mundæ facie*; Morif. sect. 14. t. 2. f. 10.)—Barren fronds pinnate; leaflets decurrent, sinuated; the upper ones confluent. Native of various parts of North America, in moist shady places. It has long been known in the more curious gardens of England. The root, of course, is perennial. Fronds several, about a foot and a half, or two feet, high, with long smooth stalks; the barren ones composed of several oblong leaflets, more or less deeply waved or sinuated, the uppermost confluent, and all somewhat decurrent, smooth and of a thin texture, so delicate that, as we have heard, the frond soon fades after being drawn through the hand while growing; which Morison also relates on the authority of Simon Paulli. The fertile fronds have a totally different appearance, each leaflet resembling a crowded spike of capsules, which it was actually taken to be by Mitchell, Linnæus, and the writer of this in the Memoirs of the Academy of Turin, v. 5. Now each supposed capsule is found to be a closely reflexed lobed leaflet, whose concealed under side is covered with innumerable minute bivalve capsules, each bound with an elastic ring, as in other ferns.

2. *O. Struthiopteris*. Swartz. Filic. 111. (*Osmunda Struthiopteris*; Linn. Sp. Pl. 1522. Fl. Dan. t. 169. Gunn. Norveg. 1. t. 1. f. 1—3. *Struthiopteris germanica*; Willd. Sp. Pl. v. 5. 288.)—Barren fronds pinnate; leaflets sessile, pinnatifid; their segments rather acute, regular in length.—Native of bogs in the most northern regions of Europe, as well as in some parts of Germany and Switzerland. This is a noble fern, three or four feet high, the barren fronds not much unlike *Aspidium Filix mas* in general appearance, but larger, and scarcely crenate; the fertile ones more central and erect, with longer stalks, and composed of shorter leaflets, having the same beaded or jointed appearance as the former, from which we do not see how this plant can be generically divided. It is well worthy of a place in the bog bed of every curious garden.

3. *O. pennsylvanica*. (*Struthiopteris pennsylvanica*; Willd. Sp. Pl. v. 5. 289.)—Barren fronds pinnate; leaflets pinnatifid; their segments obtuse; the lowermost elongated and acute.—Native of Pennsylvania, from whence it was sent by Dr. Muhlenberg to professor Willdenow, who says it is very like the last, but different in the specific characters above given.

ONOCROTALUS, in *Ornithology*, a species of *Pelecanus*; which see.

ONOFRIO, St., the name of one of the famous conservatories at Naples. The boys of this conservatorio wear a white uniform. We heard them perform in the church of Santa Maria di Loreto. The performance, in general, was coarse and clumsy; genius and fire were discoverable now and then in the compositions of these students; but all was unfinished. These seminaries, which heretofore produced such great professors, seem at present to be but low in genius. However, since these institutions, as well as others, are subject to fluctuations, after being languid for some time, like their neighbour Mount Vesuvius, they will, perhaps, blaze out again with new vigour.

We went a second time to hear the boys of St. Onofrio, at the Franciscans' church. They performed a Litany, that was composed by Durante; the rest of the music, which seemed to be that of a raw and inexperienced composer, was by a young man, who beat time. There was again a solo on the instrument called "La Voce Humana;" it is of an agreeable tone, has a great compass, but was not well played

on. A concerto on the violin was likewise introduced, where hand and fire were discovered by the player, but no taste or feeling.

We were admitted into the interior of the conservatorio of St. Onofrio the next day, and visited all the rooms where the students practise, eat, and sleep. On the first flight of stairs was a trumpeter, screaming upon his instrument till he was ready to burst; on the second was a French horn, bellowing in the same manner. In the common practising room there was a Dutch concert, consisting of seven or eight harpichords, more than as many violins, and several voices, all performing different things, and in different keys: other boys were writing in the same room; but it being holiday time, many were absent who usually studied and practised in this room. The jumbling them all together in this manner may be convenient for the house, and may teach the boys to attend to their own parts with firmness, whatever else may be going forward at the same time; it may likewise give them force, by obliging them to play loud in order to hear themselves; but in the midst of such jargon, and continued dissonance, it is wholly impossible to give any kind of polish or finishing to their performance; hence the slovenly coarseness so remarkable in their public exhibitions; and the total want of taste, neatness, and expression in all these young musicians, till they have acquired them elsewhere.

The beds, which are in the same room, serve for seats to the harpichords and other instruments. Out of thirty or forty boys who were practising, we could discover but two who were playing the same piece. The violoncellos practise in another room; and the flutes, hautbois, and other wind instruments, in a third, except the trumpets and horns, which are obliged to sag, either on the stairs, or on the top of the house.

The only vacation in these schools, in the whole year, is in autumn, and that for a few days only: during the winter, the boys rise two hours before it is light, from which time they continue their exercise, a hour and a half at dinner excepted, till eight o'clock at night; and this constant perseverance, for a number of years, with genius and good teaching, must produce great musicians.

ONOMANCY, or rather ONOMAMANCY, the art of divining the good or evil fortune which shall befall a man, from the letters of his name.

The word is supposed to be formed from the Greek *ονομα*, *name*, and *μαντια*, *divination*. Indeed, there is something singular in the etymology; for in strictness, onomancy should rather signify divination by asses; being formed from *ovos*, *asinus*, and *μαντια*: to signify divination by names, it should be *onomatomancy*.

Onomantia was a very popular and reputable practice among the ancients. The Pythagoreans taught, that the minds, actions, and successes of men, were according to their fate, genius, and name; and Plato himself seems somewhat inclinable to the same opinion.

One of the greatest rules of onomancy, among the Pythagoreans, was, that an even number of vowels in a name signified an imperfection in the left side of a man; and an odd number in the right. Another rule, about as good as this, was, that those persons were the most happy, in whose names, the numeral letters, added together, made the greatest sum; for which reason, say they, it was, that Achilles vanquished Hector; the numeral letters in the former name amounting to a greater number than the latter.

And it was, doubtless, from a principle much of the same kind, that the young Romans toasted their mistresses

at their meetings as often as there were letters in their names. Thus Martial,

“*Nævia sex cyathis, septem Justina bibatur.*”

ONOMATOPŒIA, formed from *ονομα*, *name*, and *ποιω*, *ingo*, *I feign*, in *Grammar* and *Rhetoric*, a figure of speech, whereby names and words are formed to the resemblance of the sound made by the thing signified.

Thus in the word *trique-trac*, formed from the noise made by moving the men at this game: and from the same source arise the *buz* of bees, the *grunting* of hogs, the *cackling* of hens, the *snoring* of people asleep, the *clashing* of arms, &c.

The surest etymologies are those deduced from the onomatopœia.

ONONDAGO, or SALT Lake, in *Geography*, a lake of America, in New York, about six miles long and one broad, which discharges its waters to Seneca river. It derives its saltiness from saline springs, a few miles from its banks, and furnishes immense quantities of salt to the great benefit of the country.

ONONDAGO, a river of New York, which rises in the Oneida lake, and runs westward into lake Ontario at Oswego. It is passable by boats from its mouth to the head of the lake, 74 miles, except the interval of a fall which is 20 yards; and thence batteaux go up Wood creek almost to Fort Stanwix, 40 miles, whence there is a portage of a mile to Mohawk river. Towards the head of this river there is plenty of salmon.—Also, a county of New York, consisting of military lands, divided into nine townships: this county is bounded W. by Ontario county and N. by lake Ontario, the Onondago river and Oneida lake. The county courts are held in the village of Aurora, in the township of Scipio. Onondago county is well adapted to inland navigation, on account of its two navigable rivers, Seneca and Oswego, its five lakes and a number of creeks. The inhabitants are 7406.—Also, a post-town, and formerly the chief town of the Six Nations, situated in a pleasant and fertile part of the country, on the S. end of the lake of the same name, and consisted of five small towns or villages.

ONONDAGOES, a tribe of Indians, who live near Onondago lake. Between 20 or 30 years ago they could furnish 260 warriors. This nation, now consisting of 450 persons, receives annually from the state of New York 2000 dollars, and from the United States about 450 dollars. N. lat. 42° 58'. W. long 75° 40'.

ONGHOUAGO, a town of America, in New York, seated on the Susquehanna; 13 miles E. of Chenango.

ONONIS, in *Botany*, an ancient Greek name, occurring both in the works of Theophrastus and Dioscorides; but whether their *Ononis* is comprehended in the present genus we cannot confidently say. At any rate their plant was a sort of Vetch, and of the same class and natural family with the present *Ononis*, and its name, derived from *ovos*, *an ass*, and *ονημι*, *to delight*, implies that it was grateful food to those animals.—Linn. Gen. 370. Schreb. 490. Willd. Sp. Pl. v. 3. 988. Mart. Mill. Dict. v. 3. Sm. Fl. Brit. 758. Ait. Hort. Kew. ed. 1. v. 3. 21. Thunb. Prodr. 129. Juss. Gen. 354. Lamarck Dict. v. 1. 505. Illustr. t. 616. Gærtn. t. 154. (Anonis; Tournef. t. 229.)—Class and order, *Diadelphia Decandria*. Nat. Ord. *Papilionaceæ*, Linn. *Leguminosæ*, Juss.

Gen. Ch. *Cal.* Perianth inferior, almost as long as the corolla; cloven into five, linear segments, slightly arched upwards; the lowest under the keel. *Cor.* papilionaceous; standard heart-shaped, striated, depressed at the sides more than

than the other petals; wings ovate, half the length of the standard; keel acuminate, generally longer than the wings. *Stam.* Filaments ten, forming an undivided cylinder; anthers simple. *Pist.* Germen superior, oblong, villose; style simple, ascending; stigma obtuse. *Peric.* Legume turgid, rhomb-shaped, somewhat hairy, sessile, of one cell and two valves. *Seeds* few, kidney-shaped.

Eff. Ch. Calyx in five linear segments. Standard striated. Legume turgid, rhomboid, sessile. Filaments in one undivided set.

Obs. Only thirty-one species of this numerous and rather ornamental genus are enumerated in the 14th edition of the *Systema Vegetabilium*; fourteen of which, with the addition of *O. geminata*, are all that the first edition of the *Hortus Kewensis* contains. Professor Martyn describes thirty-six species; and Willdenow, including those of Thunberg from the Cape of Good Hope, has given sixty-eight. These are divided into five sections, from each of which we purpose to give examples of the most interesting, or handsome, plants.

Sect. 1. Flowers nearly sessile.

O. arvensis. Rest-Harrow. Cammock. Sm. Fl. Brit. 758. Engl. Bot. t. 682. (*O. spinosa* β, Linn. Sp. Pl. 1006.)—Stem hairy. Branches at length spinous. Flowers mostly solitary. Leaves generally simple, entire towards their base. This is the only British species, and may be found very generally in the borders of barren, sandy fields, by way sides, and by the sea-shore, flowering from June to September.—*Root* perennial, woody, blackish. *Stems* rather erect or procumbent, annual, round, woody, leafy, hairy, spinous when old. *Leaves* alternate, stalked, elliptically wedge-shaped, linear, roughish; the lower ones often ternate. *Stipulas* very large, ovate, embracing the stem, toothed. *Flowers* axillary, solitary, slightly stalked, elegantly rose-coloured. *Seeds* dotted with tubercles.

With respect to the varieties of *O. arvensis*, which have been considered as forming separate species, Dr. Smith remarks, "We are persuaded the *O. spinosa*, Syst. Veg. ed. 14. 651, is only the *arvensis* or *inermis*, in an older or more starved state, and also that the *O. repens*, Linn. Sp. Pl. 1006, is merely a procumbent, maritime variety. *O. antiquorum* of Linnæus really appears not to differ from *arvensis*." Willdenow thinks differently, but we cannot yield to his opinion without further means of judging respecting it.

O. hircina. Stinking Rest-Harrow. Willd. n. 3. Jacq. Hort. Vind. v. 1. 40. t. 93.—Flowers somewhat spiked, in pairs. Lower leaves ternate; upper solitary, rather hairy. Branches villose.—Found in various parts of the continent of Europe. It flowers at Kew from May to August.—*Root* perennial, hard, woody. *Stems* procumbent in the lower part, ascending upwards. *Leaves* ovate, acutely ferrated, smooth above, hairy beneath. *Stipulas* ferrated, embracing the stem. *Flowers* on very short stalks, of a beautiful purple or red colour. *Legume* brown and rather hairy. The whole herb has a very strong, disagreeable smell, resembling that of goats, and is never spinous.

O. minutissima. Small-flowered Rest-Harrow. Linn. Sp. Pl. 1007. Jacq. Austr. v. 3. 23. t. 240. (*O. lutea* sylvestris minima; Column. Echph. p. 1. 304. t. 301.)—Flowers lateral. Leaves ternate, smooth. *Stipulas* sword-shaped. Calyx rough, longer than the corolla.—Native of the south of Europe, flowering in June and July. *Root* perennial, woody, branched. *Stems* numerous, upright, generally simple. *Leaves* alternate, stalked, fringed with hairs. *Stipulas* lanceolate, pointed, glandular at the edge. *Flowers* sessile, solitary, small, yellow. *Legume* pointed, dark brown.

Sect. 2. Flowers on awnless or simple stalks.

O. pubescens. Linn. Mant. 267. Willd. n. 20. (*O. Morisoni*; Gouan. Illustr. 47. *Anonis purpurea* procumbens verna seu præcox fruticosa annua viscosa, filiquis crassioribus lentiformibus rarius dispositis; Moris. Hist. v. 2. 168.)—Flower-stalks very short. Upper leaves simple. *Stipulas* ovato-lanceolate, entire.—Native of the south of Europe, and found by Gouan in the Balearic Islands. *Stem* a foot high, branched, diffuse, round. *Lower leaves* ternate; leaflets ovate or oval, obtuse, acutely ferrated. *Flowers* many together, chiefly towards the ends of the branches, purple. We know of no figure of this species. It is entirely covered with a sort of viscid downiness.

O. persica. Willd. n. 21. Burm. Ind. 157. t. 49. f. r.—Stalks bearing two flowers, racemose. Leaves ternate, wedge-shaped, three-toothed. Spike leafy, terminal.—Native of Persia. *Stem* scarcely a span long, procumbent, loosely branched. *Leaflets* shortly stalked, wedge-shaped. *Stipulas* and *bractæas* lanceolate, embracing the stem. *Flowers* purple, in leafy, terminal spikes.

O. laxiflora. Willd. n. 38. Desfont. Atlant. v. 2. 146. t. 190.—Stalks single-flowered, longer than the leaf. Leaves ternate, obovate, ferrated. *Stipulas* roundish. *Legumes* villose, nodding.—Found upon the uncultivated hills at Algiers. *Root* annual. *Stem* erect, branched, hairy. *Leaflets* obovate, toothed, scarcely downy. *Flowers* axillary, solitary, inclining to a blue colour.

O. cenisa. Linn. Mant. 267. Villars. Dauph. v. 3. 433. Allion. Pedem. v. 1. 319. t. 10. f. 2.—Stalks single-flowered. Leaves ternate, wedge-shaped. *Stipulas* ferrated. *Stems* prostrate.—Native of Mount Cenis. *Stems* three or four inches long, slightly branched, smooth. *Leaflets* smooth, roundish at the end, delicately ferrated. *Flowers* solitary, striated, purple. Villars and Allioni consider the *O. reclinata* of Linnæus to be merely a variety of this.

Sect. 3. Flowers on awned or bearded stalks.

O. Cberleri. Linn. Sp. Pl. 1007. Desfont. Atlant. v. 2. 148.—Stalks single-flowered. Leaves ternate, toothed at the end, viscid and hairy. Calyx longer than the corolla.—Native of Spain, Italy, and Barbary. *Root* woody. *Stem* procumbent, lax. *Leaves* nearly sessile. *Stipulas* lanceolate, ferrated. *Flowers* axillary, their stalks erect, but nodding with the legume.

O. Natrix. Linn. Sp. Pl. 1008. Curt. Mag. t. 329. (*O. lutea*; Camer. Epit. 445.)—Stalks single-flowered. Leaves ternate, viscid. *Stipulas* entire. *Stem* rather shrubby.—Found about hedges in France and Spain. *Root* large and wrinkled. *Stems* about a foot high, more or less erect. *Leaflets* oblong, toothed at the end. *Flowers* solitary, large, yellow, streaked with red. The whole plant is viscid, and has a resinous smell.

Sect. 4. Shrubby.

O. tridentata. Linn. Sp. Pl. 1009. Cavan. Ic. v. 2. 41. t. 152.—Stalks two-flowered. Leaves ternate, fleshy, somewhat linear, three-toothed.—Found in several parts of Spain. *Stem* a foot and half high, much branched; its bark white, downy, very slightly glutinous. *Leaves* stalked, glaucous. *Stipulas* short, tapering. *Flowers* in terminal clusters, rose-coloured, on axillary, jointed stalks.

O. fruticosa. Linn. Sp. Pl. 1010. Curt. Mag. t. 317.—Stalks about three-flowered. Leaves sessile, ternate, lanceolate, ferrated, stipulas sheathing.—Native of mountains in Dauphiny, and other parts of the south of Europe. This is a very beautiful low shrub, with numerous, woody stems about two feet high, jointed and branched. *Leaves* rather fleshy, smooth, and shining. *Flowers* on long stalks, panicle,

panicked, terminal, about three together, large, lilac or rose-coloured. Authors mention a variety of this species with white flowers.

O. rotundifolia. Linn. Sp. Pl. 1010. Curt. Mag. t. 355. —Stalks about three-flowered. Leaves ternate, roundish, toothed. Calyx of three, bracteated leaves—Native of the Swiss Alps. *Stem* round striated, rather hairy, nearly two feet high. *Leaves* on stalks, ternate, the end leaflet larger and rounder than the others. *Stipules* green, sheathing, slightly serrated, ribbed. *Flowers* large and handsome, about three in a bunch, on long stalks, terminal, of a fine rose-colour, though Miller, by mistake, describes them pale yellow. It is a taller plant than the last, with wider leaflets.

Seçt. 5. *Dubious*.

In this section Willdenow enumerates six species, all taken from Thunberg's Prodromus, and natives of the Cape of Good Hope, and quite unknown to us.

ONONIS, in *Gardening*, contains plants of the shrubby kind, of which the species principally cultivated are; the yellow-flowered shrubby rest-harrow (*O. natrix*); the three-tooth-leaved rest-harrow (*O. tridentata*); the shrubby rest-harrow (*O. fruticosa*); and the round-leaved rest-harrow (*O. rotundifolia*).

But there are other species both of the annual and perennial kinds, that may be cultivated for variety.

The third sort varies with white flowers.

Method of Culture.—These plants may be increased by seeds, cuttings, and slips, according to the different kinds.

The seeds of the first sort should be sown upon beds of light earth in the early spring, as about April, thinly in drills, when they should be properly thinned out during the summer months, and kept perfectly free from weeds; when in the beginning of the autumn they may be removed into the places where they are to remain. It may likewise be increased by cuttings planted out at the same time.

But though this sort is pretty hardy when the winters are not very severe, a few plants should always be kept in the greenhouse. And as it is apt to grow out of form it should be kept well cut in, and new plants be frequently raised from seeds.

These plants cannot be preserved in pots. They do not flower until the second year.

The second sort should have the seeds sown in pots and placed in a mild hot-bed, or on a very warm sheltered border, in the early spring; but the first is the best method, the plants being afterwards managed as tender plants, having either the protection of the greenhouse or of mats.

The third sort is raised from seeds sown either in pots or warm borders in the early spring months. It succeeds best in shady situations where the soil is of a sandy quality. The potted plants are often introduced in greenhouse collections; but they are capable of withstanding the severity of most winters in the open air.

And the fourth sort should have the seeds sown in the early spring on an open border, the plants being afterwards properly thinned and kept clear from weeds. It may likewise be raised from slips planted out at the same season. It is very hardy, and requires little trouble in its cultivation.

These are all plants which afford ornament and variety in the borders, or among other potted plants of the greenhouse kind.

ONONYCHITES, formed from *onos*, *afis*, and *ovvξ*, *hoof*, something that has hoofs like the feet of an afs.

ONONYCHITES was an appellation which the heathens in

the first century gave the God of the Christians, because they owned and adored the same God with the Jews.—For it was a notion (however it had its rise), as appears from Tacitus, Hist. lib. v. cap. 3. that the Israelites, much afflicted with thirst, were led to a spring by an afs going to drink; and that, in gratitude for the benefit, they worshipped an afs; and that the Christians did so likewise. See Tertull. Apol.

ONOPORDUM, in *Botany*, a name to be found in the works of Pliny, derived from *onos*, *afinus*, and *περδεω*, *pedere*. Professor Martyn, by way of illustrating this derivation, says that it means *crepitus asini*.—But from what cause this whimsical appellation is bestowed on the present genus, it is difficult to determine. (See LYCOPERDON.)—Linn. Gen. 409. Schreb. 538. Willd. Sp. Pl. v. 3. 1686. Mart. Mill. Dict. v. 3. Sm. Fl. Brit. 856. Prod Fl. Græc. Sibth. v. 2. 155. Ait. Hort. Kew. ed. 1. v. 3. 146. Juss. 173. Lamarck Dict. v. 4. 555. Illustr. t. 664. Gærtn. t. 161.—Class and order, *Syngenesia Polygamia Æqualis*. Nat. Ord. *Compositæ Capitatae*, Linn. *Cinaccephala*, Juss.

Gen. Ch. *Common calyx* roundish, ventricose, imbricated with numerous, spinous scales, prominent every way. *Cor.* compound, tubular, uniform; the florets hermaphrodite, equal, each of one petal, funnel-shaped; tube very slender; limb erect, ventricose, cloven into five equal segments, one of them more deeply separated. *Stam.* Filaments five, capillary, very short; common anther cylindrical, tubular, the length of the corolla, five-toothed. *Pist.* Germen ovate; style thread-shaped, longer than the stamens; stigma with a crown. *Peric.* none, except the permanent, slightly converging, calyx. *Seeds* solitary; down capillary, sessile. *Recept.* scaly; the scales combined into cells, truncated, mucronated, shorter than the seeds.

Eff. Ch. Calyx swelling, its scales spreading and spinous. Receptacle cellular, a little scaly.

1. *O. Acanthium*. Cotton Thistle, or Woolly Onopordum. Linn. Sp. Pl. 1158. Engl. Bot. t. 977. Curt. Lond. fasc. 5. t. 57. Fl. Dan. t. 909.—Calyx-scales spreading every way, awl-shaped. Leaves ovato-oblong, sinuated, woolly on both sides.—This native of Britain, a very conspicuous plant, occurs partially in waste ground about towns, on a gravelly soil, flowering in July or August. —*Root* biennial, spindle-shaped. *Stem* erect, five feet high, branched, winged with decurrent, spinous leaves. *Flowers* terminal, solitary, erect, purple, very handsome and showy. *Seeds* obovate, brown, shining; their down unequal, rough, deciduous, reddish.—The whole herb is clothed with a sort of cottony web, which is easily rubbed off, and its seeds are said to be a favourite food with the goldfinch, *Fringilla carduelis* of Linnæus.

2. *O. tauricum*. Tartarian Onopordum. Willd. n. 2. —Calyx-scales spreading every way. Leaves decurrent, smooth on both sides, sinuated, toothed, spinous.—Native of Tartary. Similar in habit to the last, but perfectly smooth in all its parts, and somewhat smaller.—This new species is given entirely on the authority of Willdenow, who drew his specific character of it from a dried specimen.

3. *O. macrocanthum*. Morocco or Long-scaled Onopordum. Willd. n. 3. Schousb. Marocc. 198. t. 5.—Calyx-scales much spreading, as long as the calyx. Leaves decurrent, downy, sinuated, toothed, spinous; radical ones pinnate.—Native of the empire of Morocco.—Dr. Sibthorp found it in the Archipelago.—This also is taken from Willdenow, who merely says that he saw a living specimen

of

of it, and that it differs from *O. Acanthium* in having longer calyx-scales, and its radical leaves pinnate,

4. *O. illyricum*. Illyrian Onopordum. Linn. Sp. Pl. 1158. Jacq. Hort. Vind. v. 2. 69. t. 148. — Lower calyx-scales reflexed; upper much spreading. Leaves decurrent, downy, sinuated, deeply toothed, and very spinous. — Native of the south of Europe, flowering in July and August. — Stem six or seven feet high, branched from its base, broadly winged, and extremely spinous. Leaves long and narrow, scarcely exceeding the stem in width, of a greenish-white colour, deeply cut at their sides into ovate or lanceolate segments, so as to be almost pinnatifid. — The habit of this magnificent species, whose purple flowers are said by Jacquin to be sometimes double the size of what he has figured, is also very similar to that of the first species.

5. *O. deltoides*. Siberian Onopordum. Ait. Hort. Kew. ed. 1. v. 3. 146. Willd. n. 5. — Calyx squarrose, webbed with down. Leaves stalked, ovate, angulated, downy beneath. — Native of Siberia. It flowers in August, and is perennial. — Introduced at Kew in the year 1784, by Mr. John Bell. — We know not that this is any where figured. The leaves resemble those of a Burdock.

6. *O. græcum*. Græcian Onopordum. Linn. Suppl. 349. Gouan. Obf. 64. t. 25. — Calyx-scales ovato-lanceolate, mucronated. Leaves awl-shaped or lanceolate, decurrent, somewhat sinuated, downy. — Native of the Levant. Root annual. Stem from one to three feet in height, very downy. Radical-leaves a foot or more in length, on a pinnatifid stalk, hoary with down. Flowers stalked, solitary, terminal, purplish.

7. *O. arabicum*. Arabian Onopordum. Linn. Sp. Pl. 1159. Jacq. Hort. Vind. v. 2. 70. t. 149. — Calyx-scales ovate, mucronated, adpressed. Leaves decurrent, rather downy, sinuated, toothed, spinous. — Native of the south of Europe, flowering in July. — This very handsome plant, whose large imbricated calyx is beautifully variegated, rises to the height of six or eight feet. Stem erect, angular, hollow, branched. Leaves lanceolate, very sharply spinous, beautifully veined and covered on both sides with woolly down. Flowers erect, stalked, solitary, large, purple.

8. *O. uniflorum*. Single-flowered Onopordum. Willd. n. 8. Cavan. Ic. v. 1. 60. t. 88. — Stem none. Calyx cylindrical, sessile; its scales ovate, mucronated, adpressed. Leaves stalked, woolly, toothed, spinous. — Native of Spain. Root spindle-shaped, brown. Stem none. Leaves all radical, nearly pinnatifid, covered with a white down, their segments terminated by a yellow spine. Flower solitary, sessile. Seeds solitary, crowned with very long down. Willdenow remarks that this is similar to the following, but that its leaves are not pinnatifid, whilst its calyx-scales are mucronated and adpressed.

9. *O. acaulon*. Dwarf Onopordum. Linn. Sp. Pl. 1159. Jacq. Ic. Rar. t. 167. — Stem scarcely any. Calyx globose, nearly sessile; its scales lanceolate, spinous, much spreading. Leaves on stalks, pinnatifid, toothed, spinous, downy. — Found by Dr. Sibthorp in Greece. It was cultivated in 1739, by Mr. Miller, and flowers in July and August. — Root biennial, spindle-shaped. Stem simple, about two inches long, terminated by a sessile, red and white flower. Leaves clustered, of a beautiful glaucous hue, and spreading horizontally, so as to make the plant appear stemless. — Martyn considers the last species to be only a variety of this.

10. *O. rotundifolium*. Round-leaved Onopordum. Allion. Pedem. v. 1. 144. t. 38. f. 1. Willd. n. 10. — Stem nearly wanting. Calyx oblong, almost sessile, its scales oblong-lanceolate, downy, without spines. Leaves stalked, roundish,

heart-shaped, notched or toothed, without spines, downy. — Found in dry, stony places in Switzerland and Italy. Root thick and succulent. Radical-leaves about three or four, roundish, firm, thick, woolly and veined. Flowers composing a large, solitary, nearly sessile, bell-shaped, head.

Professor Martyn retains the *O. orientale*, Mill. Dict. n. 4. which is a native of Aleppo, and rises with an upright, branching stem, seven or eight feet high. Leaves long and regularly sinuated on their borders, like pinnatifid leaves. Flowers in large heads. Calyx very squarrose and prickly. — Is it distinct from the following?

11. *O. elatum*. Tall Onopordum. Sm. Prodr. Fl. Græc. Sibth. v. 2. 156. Fl. Græc. (ined.) t. 833. (Carduus creticus, acanthi folio viridi et glutinolo, flore purpurascens; Tourn. Cor. 31.) — Calyx-scales widely spreading, as long as the calyx. Leaves decurrent, sinuated, toothed, spinous, hairy. Gathered in Crete by Tournefort and Sibthorp. Root biennial. Whole herb hairy all over, and of a green colour, not downy or woolly. The flowers are two or three inches broad.

ONORE, in Geography, a sea-port town on the W. coast of Hindooستان, in the country of Canara. When the Portuguese first arrived in India, this town was the capital of a kingdom; which they first acknowledged as their ally and afterwards reduced to the condition of a subject. They erected a fortress for the security of their pepper trade; but the natives, assisted by the Dutch, took it from them, and the influence of the Portuguese long ago declined. In 1783 it was taken by storm by the British troops, commanded by Gen. Matthews, and in 1799 it was ceded to Great Britain; 46 miles N.W. of Bednore and 15 from Pigeon island, which is in N. lat. 14° 1'. E. long. 74° 6' 30".

ONOS, in Ichthyology, a name given by some authors to the *æglefinus*, or common haddock. See *GADUS Æglefinus*.

ONOS is used by Athenæus, and many other of the Greek writers, for the fish which we call the *bake*, the *afellus minor* of authors, called by Bellonius, Gefner, and some others, the *merlucius*. See *GADUS Merlucius*.

ONOSANDER, in Biography, was a Greek author and Platonic philosopher; concerning the period in which he lived nothing certain can be ascertained, except that he flourished under the Roman emperors. He wrote commentaries upon the "Politics" of Plato, which have not come down to us. He was likewise author of a work of much celebrity, entitled "Στρατηγικὸς Λόγος," being a treatise on the duties and virtues of a general of an army. This treatise was first published in a Latin version by Nicholas Saguntin, at Basil in 1541. A new version of it was made by Joachim Camerarius, and published by his sons at Nuremberg in the year 1595. In 1601 M. Riganlt published an edition of it at Paris, in Greek and Latin, with notes, and since that time various editions and translations of it have appeared. Moreri.

ONOSERIS, in Botany, so called by Willdenow, from *onos*, an *ass*, and *seris*, *succory*, apparently to preserve some analogy with *Hyoferis*, *Arnoferis*, &c.; for there is no sort of meaning in the particular application of the name to the plants in question, of which he has framed a genus out of the Linnæan *Atractylis*. — Willd. Sp. Pl. v. 3. 1702. — Class and order, *Syngenesia Polygamia-equalis*. Nat. Ord. *Compositæ discoideæ*, Linn. *Corymbifera*, Juss.

Ess. Ch. Receptacle nearly naked. Down of simple hairs. Calyx imbricated. Corolla radiated; the florets of the radius three-toothed.

1. *O. purpurata*. Willd. n. 1. (*Atractylis purpurata*; Sm. Plant. Ic. t. 65. *A. purpurea*; Linn. Suppl. 349.) — Leaves

Leaves lyrate, toothed; their terminal lobe hastate.—Gathered by the celebrated Mutis in New Granada. Whether this plant be caulescent or not is uncertain, but the specimen described seems to be the top of a woolly branch, crowned with several leaves and a branched flower-stalk. The leaves are a span long, acute, sharply toothed; their terminal lobe half their whole length. Their upper side is naked and peculiarly smooth; the under densely woolly and snow-white. Flower-stalk longer than the leaves, clothed above with awl-shaped scales, resembling those of the calyx. Flowers purple, resembling an *Aster*, and near two inches wide when expanded. Their radiant florets are remarkable for a capillary spiral appendage, like an upper or inner lip.

2. *O. mexicana*. Willd. n. 2. (*Atractylis mexicana*; Linn. Suppl. 350. Sm. Plant. Ic. t. 66.)—Leaves lanceolate, entire.—Sent from the same country, by the same great botanist, to Linnæus. The stem seems shrubby, with long, simple, round, woolly, leafy branches. Leaves alternate, on short woolly stalks, lanceolate, acute, entire, three inches long, single-ribbed; smooth and shining above; white and woolly beneath, with glandular dots among the wool. Flower solitary, terminal, much like the last in structure and colour, but rather smaller, and its radiant florets are destitute of the spiral lip.

Doubting the propriety of establishing this genus, we have abstained from giving its full natural character. See *ATRACTYLIS*.

ONOSMA, the name of a plant mentioned by Dioscorides and Galen, derived, as it seems, from *οσμη*, a sweet smell, or *savour*. Linnæus has arbitrarily applied it to the present genus.—Linn. Gen. 76. Schreb. 102. Willd. Sp. Pl. v. 1. 773. Mart. Mill. Dict. v. 3. Ait. Hort. Kew. ed. 2. v. 1. 295. Juss. 130. Lamarck Dict. v. 4. 582. Illustr. t. 93. Gærtn. t. 67.—Class and order, *Pentandria Monogynia*. Nat. Ord. *Asperifolia*, Linn. *Borraginea*, Juss.

Gen. Ch. Cal. Perianth inferior, in five lanceolate, erect, permanent segments. Cor. of one petal, bell-shaped; tube very short; limb tubular and swelling, rather thicker than the tube; its border generally five-cleft; throat naked, pervious. Stam. Filaments five, awl-shaped, very short; anthers arrow-shaped, erect, the length of the corolla. Pist. Germen superior, four-cleft; style thread-shaped, the length of the corolla; stigma obtuse. Peric. none, except the unchanged calyx. Seeds four, ovate.

Eff. Ch. Corolla bell-shaped, with a pervious throat. Seeds four. Style the length of the corolla.

1. *O. simplicissima*. Siberian Simple Onosma. Linn. Sp. Pl. 196. Gmel. Sibir. v. 4. 76. t. 40.—Leaves much crowded, linear-lanceolate, hairy. Fruit erect.—Native of Siberia, and on calcareous rocks by the Wolga. It flowers from April to June. Stems about a span high, simple, woody, occasionally with one or two branches at their base. Leaves greatly crowded together, so as to be almost imbricated, very narrow and attenuated at the base. Flowers terminal, white, generally in two clusters, at the ends of the stems, scarcely stalked. The wild plant is never more than a foot high, and is soft to the touch.

2. *O. taurica*. Golden-flowered Onosma. Pallas Tableau de la Tauride, 47. Annals of Bot. v. 2. 411. Sims in Curt. Mag. t. 889.—Stems simple, rising from a spreading base. Leaves linear-lanceolate, with white hairs on both sides. Fruit erect. Frequent in the open hills of Tauria, as well as on the mountains of the Caspian Caucasus, flowering in May and June. Root perennial. Stem upright, round, waved, hairy. Leaves solitary, alternate, fringed with hairs. Flowers in large, handsome, terminal, drooping clusters, of a rich yellow, or golden colour,

3. *O. orientalis*. Oriental Onosma. Linn. Sp. Pl. 196. Willd. n. 2. (*Cerinthe orientalis*; Amoen. Acad. v. 4. 267.)—Corolla cylindrical, acute. Leaves linear, hairy. Fruit pendulous.—Native of the Levant. It flowers in May and June. Stems round, hispid. Leaves alternate, sessile, entire, hispid, with green or whitish hairs. Flowers on stalks, yellow, in a terminal double cluster.

4. *O. echioides*. Hairy Onosma. Linn. Sp. Pl. 196. Jacq. Austr. v. 3. 52. t. 295.—Corolla cylindrical, obtuse. Leaves lanceolate, hispid. Fruit erect.—Native of the south of Europe, flowering from March to June. Root perennial, long, simple, with a red bark. Stem generally a foot and half or two feet in height, much branched in the upper part, covered with pellucid, erect hairs or bristles, each of which springs from a callous point. Leaves hairy; the lower ones attenuated towards the base; upper sessile, somewhat heart-shaped at the base. Flowers yellow, in clusters at the ends of the branches, resembling the flowers of a *Symphytum*. The whole herb is very hairy.

Linnæus mentions a variety (β) of this species, and quotes it as figured in Column. Ecphr. t. 183. Dr. Smith however considers the plant of Columna as a distinct species. See his Tour on the Continent, ed. 2. v. 2. 325.

5. *O. tinctoria*. Deep-coloured Onosma. Annals of Bot. v. 2. 410. (*Cerinthe echioides*; Scop. Carn. ed. 2. n. 197.)—Stem branched in the upper part. Leaves lanceolate-linear, hispid, green on both sides. Fruit erect. Corolla longer than the calyx.—Native of pastures in Tauria, flowering in the spring. This new species of *Onosma* is greatly akin to the last, but differs in size, being of a more humble and simple habit. Root perennial, its bark staining of a blood colour. Leaves somewhat narrower than in the last. Flowers smaller, pale, of a lemon-colour when old.

6. *O. sericea*. Silky-leaved Onosma. Willd. n. 4. Ait. Hort. Kew. ed. 2. v. 1. 296.—Leaves stalked, oblong-lanceolate, covered with silky hairs.—Native of the Levant. Stem quite simple, a span high, white with down. Leaves oblong, acute, attenuated at the base and tip, thickly clothed on both sides with hairs. Corolla dilated at the upper part.

7. *O. carulea*. Willd. n. 5. (*Symphytum orientale angustifolium flore cæruleo*; Tourn. Cor. 7.)—Leaves sessile, lanceolate, hairy and soft. Stamens longer than the corolla.—Native of Armenia. Stem a foot high, simple, white with down. Radical-leaves stalked; those of the stem sessile, ciliated at the margin. Corolla cylindrical, blue, dilated above.

Willdenow remarks that this is nearly allied to *Anchusa lanata*, but that its leaves are not so woolly, nor is it furnished with a nectary.

8. *O. tenuiflora*. Slender Onosma. Willd. n. 6. (*Symphytum orientale echii folio, flore albo tenuissimo*; Tourn. Cor. 6.)—Leaves sessile, linear, obtuse, hairy. Corolla cylindrical, a little longer than the linear calyx-leaves.—Native of the Levant. Distinct from every other species in the smallness of its leaves, which are linear, obtuse, hispid, and scarcely the third of an inch in length.

9. *O. caspica*. Caspian Onosma. Willd. n. 7. (*O. orientalis*; Pallas. It. v. 2. t. L.)—Stem branched, divaricated. Leaves oblongo-lanceolate, hispid. Flower-stalks axillary, when bearing the fruit reflexed. Corolla obtuse.—Found in a sandy soil on the borders of the Caspian sea. Willdenow says this is perfectly distinct from *orientalis*, in having a branched, diffuse stem, its flowers axillary, and smaller.

10. *O. micrantha*. Small-flowered Onosma. Willd. n. 8. (*O. micranthos*; Pallas. It. v. 2. app. n. 100. t. L.)—Stem branched, divaricated. Leaves stalked, oblong, white with hairs beneath. Clusters naked. Native of sandy places in Siberia.

Siberia. Willdenow tells us this may be easily known from all the other species by its *leaves* having very long stalks; its *clusters* being terminal and compound, without any bracteas; and its *calyx* equal in length to the *corolla*.

ONOSMODIUM, so called by Michaux, as having a likeness to *Onosma*, from which, according to that author, it differs in having a much shorter corolla, whose limb is acutely and more deeply divided, as well as less spreading, and the anthers sessile, as well as less pointed. Michaux Boreali-Amer. v. 1. 132.—Class and order, *Pentandria Monogynia*. Nat. Ord. *Asperifolia*, Linn. *Borraginee*, Juss.

Gen. Ch. *Cal.* Perianth inferior, in five deep, narrow, linear, erect, permanent segments. *Cor.* of one petal, oblong, somewhat bell-shaped; tube very short; limb swelling, cloven half way down into five, half-lanceolate, acute, erect and approximated segments, whose margin is inflexed; throat naked, pervious. *Stam.* Filaments wanting; anthers five, sessile, included, arrow-shaped, acute. *Pist.* Germen superior, four-cleft; style thread-shaped, much longer than the corolla; stigma simple. *Peric.* none, except the unchanged calyx. *Seeds* four, ovate.

Efl. Ch. Corolla somewhat bell-shaped, with a pervious throat; limb erect. Anthers sessile. Seeds four. Style much longer than the corolla.

Michaux defines two species, which are herbaceous plants, with longitudinal ribs to their leaves.

1. *O. hispidum*. (Lithospermum virginianum; Linn. Sp. Pl. 190. *L. latifolium* virginianum, flore albido longiore; Moris. sect. 11. t. 28. f. 3.)—Hispid. Segments of the corolla awl-shaped, very acute.—Native of Virginia. A hardy perennial in our gardens, flowering in June, but of no beauty to obtain general cultivation. Every part is clothed with rigid bristles. *Leaves* lanceolate, or inversely ovate, acute; clothed on the upper side with tubercles bearing hairs. *Corolla* whitish, about twice as long as the calyx.

2. *O. molle*. Mich. t. 15.—Downy. Segments of the corolla somewhat ovate.—Found in the country of Tennessee about Nashville. *Mich.* This appears to have much resemblance to the former, but the whole *herb* is hoary with soft whitish hairs. *Leaves* oblong-oval, with a central rib, and two pair of lateral ones, springing more or less from its base. *Corolla* like the last, but with broader segments.

ONOVA, in *Geography*, a town of Hungary; 4 miles N. of Pancsova.

ONREAGH, a river of the county of Tyrone, Ireland, which rises on the borders of Fermanagh, and flowing eastward, joins its waters to the Cameron.

ONRUST, a small island near the coast of Java. This island lies about three leagues N.W. from Batavia. It is nearly round, rising six or eight feet above the surface of the water, and of small extent, being about 4800 feet in circumference. In the centre of the island, and within a fort, consisting of four bastions and three curtains, stand the warehouses and other buildings. On these fortifications, and on three small outworks, constructed at the water's edge, are mounted 40 pieces of cannon of various sizes. This fortified island is well situated to command the channel that affords the principal passage into the road. Whilst this island was in possession of the Dutch, the company had ten or twelve large warehouses, almost always full of goods, consisting of pepper, Japan copper, saltpetre, tin, calatour wood, Japan wood, &c. under the direction of two administrators. On the north side of the island are two saw-mills, and on the south side there is a long pier-head, on which are three large wooden cranes, erected for fixing masts in ships, or for unstepping them. Three ships can lie

here, behind each other, alongside of the pier, in deep water, to be repaired, or to receive and discharge their cargoes. There is another pier, a little more to the westward, called the Japan pier, where one more ship can lie, to load or unload. "It would be injustice," says captain Cook, "to the officers and workmen of this yard, not to declare, that, in my opinion, there is not a marine-yard in the world, where a ship can be laid down with more convenience, safety, and dispatch, nor repaired with more diligence and skill." Although this island is but small, the number of inhabitants is supposed to be near 3000, among whom are 300 European workmen. About 1600 feet from Onrust is the island "de Kuiper," or "Cooper's" isle, one-third less in size than the former, upon which the Dutch company had several warehouses, in which coffee was laid up; and here are two pier-heads for loading and discharging ships. The island abounds with large tamarind trees, which afford an agreeable shade. To the eastward of Onrust, and at twice the distance of Cooper's isle, is the island "Purmerend," which is half as large again as Onrust; planted with shady trees, and accommodating the diseased who are sent hither from Batavia with an hospital or lazaretto. "Edam" is another island about three leagues N.N.E. from Batavia, and about half an hour's walk in circumference; very woody, and having abundance of large and ancient trees. One of them, which is the banyan-tree, and so large that 20 men, with their arms extended, cannot encompass it, is esteemed holy by the Javanese, and much venerated by them. Stavorinus's Voyages, vol. i.

ONS, a small island in the Atlantic, near the coast of Spain. N. lat. $42^{\circ} 23'$. W. long. $8^{\circ} 55'$.

ONSALD, a town of Sweden, in the province of Halland; 4 miles S.S.W. of Kongsbach.

ONSLOW, a maritime county of America, in Wilmington district, North Carolina, west of Cape Lookout; containing 5474 inhabitants, including 1757 slaves. Its chief town is Swansborough.—Also, a township of Nova Scotia, in Halifax county, at the head of the basin of Minas; 35 miles N.E. of Windsor; settled by emigrants from New England.

ONTARIO, one of the grand chain of lakes in North America, which divides the United States from Upper Canada; situated between $43^{\circ} 15'$ and 44° N. lat., and $76^{\circ} 30'$ and 80° W. long. It is of a nearly elliptic form, its greatest length being from S.W. to N.E., and its circumference about 600 miles. The division line between the state of New York and Canada on the north passes through this lake, and leaves within the United States, according to Mr. Hutchins's calculations, 2,390,000 acres of the water of the lake. It abounds with excellent fish, particularly the Oswego bass, weighing three or four pounds. Its banks are in many places steep, and the southern shore is covered principally with beech trees. The soil seems to be good. This lake communicates with lake Erie by the river Niagara: it receives the waters of Genesee river from the south, and of Onondago at fort Oswego, from the east, by which it communicates, through Oneida lake and Wood creek, with the Mohawk river. On the north-east it discharges itself into the river Catarqui, which takes the name of St. Lawrence at Montreal, and by this river into the Atlantic ocean. Its islands are situated at the eastern end, and the chief of them are Wolf, Amherst, Gage, and Howe islands.

ONTARIO, a large and fertile county of New York, bounded north by the above-described lake, west by the Genesee river, and south by Steuben county. This county is well watered by the Genesee, and also by its tributary streams, and a number of small lakes. The chief

town is Canandarqua, situated at the north-west corner of Canandarqua lake, 15 miles W. of Geneva. The number of inhabitants is 12,584, of whom 57 are slaves.—Also, a county in Upper Canada, containing the following islands: viz. Tonti, called Amherst island; Isle au Forêt, called Gage island; Grand Isle, called Wolfe island; and Isle Couchois, called Howe island; and also all the islands between the mouth of the Garoqui to the easternmost extremity of the late township of Marysburg, called Point Pleasant.

ONTARIO Fort. See OSWEGO.

ONTES, a town of France, in the department of Mont Blanc; 14 miles S. of Seyssel.

ONTOLOGY, or ONTOSOPHY, the doctrine or science *de ente*, that is, of being, in the general, or abstract, together with the various and most universal modes or affections, as well as the several kinds or divisions of it; for an account of which we refer to Watts's "Brief Scheme of Ontology." See also in this Dictionary BEING, ENS, ESSENCE, and EXISTENCE.

Ontology coincides with what in the schools is more usually called *metaphysics*; which see: and more lately, philosophy of the mind, or *Mental Philosophy*; which see.

ONTONG JAVA, in *Geography*, a group of 22 islands in the Pacific ocean, called by Mendana "Bazos de la Candelaria," but now denominated "New Ireland." S. lat. 6° 15'. E. long. 156°.

ONTORIA, a town of Spain, in Asturias, near the sea; 45 miles E.N.E. of Oviedo.

ONUM, a town of Sweden, in West Gothland; 36 miles E. of Uddevalla.

ONUPHIS, in *Ancient Geography*, a town of Egypt, and capital of a nome, called "Onuphites nomos," situated about the middle of the Delta, on the right bank of the canal called "Athribiticus Sinus," between Sebennytus and Butus.

ONYCHIA, in *Surgery*, from *ονυξ*, a nail, an abscess near the finger-nail, a whitlow.

ONYCOMANCY, or, as some write it, ONYMANCY, derived from *ονυξ*, nail, and *μαντια*, divination, a kind of divination, by means of the nails of the fingers.

The ancient practice was to rub the nails of a youth with oil and foot, or wax, and to hold up the nails, thus smeared, against the sun. Upon them were supposed to appear figures or characters, which shewed the thing required.

Hence, also, modern chiromancers call that branch of their art which relates to the inspection of the nails, onychomancy.

ONYE, in *Geography*, a town of Hindoostan, in Guzerat; 40 miles S.E. of Surat.

ONYX. The Greeks applied this term to a small abscess of the eye, when it was shaped like the finger-nail.

ONYX, in *Natural History*, the name originally given to the chalcedony with opaque stripes, of a pure white colour; and in later times applied to many agates, &c. with differently coloured stripes or zones. See the articles AGATE, CHALCEDONY, and GEMS.

ONYX, in *Conchology*, the name given by the curious to a species of voluta, found in cabinets, but never met with in that state on the sea-shores. The true account of this is, that the shell in this elegant form owes its appearance to art, having been polished, and having had its outer coat taken off. With this outer coat, which is of a dusky yellow, it is often kept in the same cabinet under another name, being then called by the French, the *cierge* or wax shell.

ONYX, *Cyprea*. See CYPREA.

ONYX, in *Zoology*, a name by which Pliny and many other of the ancient writers have called the solen.

ONYX Indicus, in the *Materia Medica of the Ancients*, a

term used by the Greek writers to express what is usually called *unguis odoratus*, or the sweet hoof. Some call it *onychus indicus*, as particularly Myrepsus, in his antidote of fifty species. The same author mentions the *blatta byzantia*, and tells us that it is not the same thing with the onyx indicus, but that the Italians called by this name the os nasi, or bone of the nose, of the purple fish. What he means by this is probably the bony tongue of that animal, nature having given it such a weapon to pierce the shells of those fish on which it is to feed. We frequently find the *chamæ*, and other shell-fish, with holes bored through the upper shell as exact as if it were done with an instrument: this has been done by the purple fish, to get at the flesh of the animal within for food; and the bony tongue, with which this fish performs this, is called, by the Italians of those times, *blatta byzantia*. Actuarius translates the *blatta byzantia* of all the earlier writers by the phrase *os nasi purpuræ*; and the interpreters of the Arabian writers give the same name to what they call *unguis odoratus*, or *onyx indicus*, for the Arabian name exactly expresses this.

ONZA, in *Geography*, a river of Africa, in the kingdom of Congo, which runs into the Atlantic, having a harbour at its mouth, but too shallow for navigation. It discharges itself at Mossala, 140 miles S. from the Zaire, S. lat. 8° 10'.

ONZAN, a cape or point on the north coast of Brasil, opposite to cape St. Lawrence, forming jointly the points of Laguariba river; the former being on the west side of the river, which river is 10 leagues S.E. by E. of Bohia Baxa.

ONZATE, a town of Italy, in the department of the Mela; 5 miles S.S.W. of Brescia.

ONZELLA, a river of Spain, which runs into the Aragon, at Sanguesa.

Ooba, a town of Japan, in the island of Nippon; 45 miles W. of Meaco.

OOBEEAN, a small island in the Sooloo archipelago. N. lat. 66°. E. long. 120° 22'.

OOCHISRAVA, in *Hindoo Mythology*, is the name of a many-headed horse, that, in the fabulous legends of India, arose from the ocean, when churned by gods and demons, as described under the article KURMAVATARA of this work. The result of this operation was the obtaining fourteen precious things, or gems, as enumerated in the article just referred to: among them the horse, the subject of this. That, in the infancy of society, the discovery of the value of this noble animal, and of the mode of applying his strength and docility to the uses of man, should be the object of recorded gratitude, is sufficiently reasonable; but whether this be the intention of the fable in question, we cannot decide. In pictures of the Kurmavata, the horse is usually represented white, and properly shaped and proportioned, except in the additional heads, seven of which project from the front of the first. This item of the popular fable of churning the ocean is seldom mentioned in the writings of the Hindoos, excepting in descriptions of that operation. The white eight-headed horse is sometimes noticed as in the suite or possession of Indra, the regent of the firmament. Some legends describe this horse as seven-headed: he then will appertain immediately to the sun. See SURYA.

OOD, in *Geography*, a town of Sweden, in West Gothland; 41 miles N.E. of Gotheborg.

OODA, a town of Japan, in the island of Nippon; 30 miles N.W. of Namba.—Also, a town of Japan, in the island of Ximo; 10 miles S.W. of Senga.

OODAPOUR, a town of Bengal; 16 miles E. of Comillah.

OODEA-

· OODEADARGAM, a town of Hindoostan, in Myfore, which gives name to a pass taken by the British troops in 1800; 31 miles S.E. of Bangalore.

OODIMALLYCOTTA, a town of Hindoostan, in Coimbatore; 17 miles E.S.E. of Annamally.

OODNAGUR, a town of Bengal; 22 miles N. of Kishenagur.

OOFARA, a town of Japan, in the island of Nippon; 120 miles W. of Meaco.

OOGGIN, or OOGGIN. See OUGGIN.

OOISCONSIN, in *Geography*, a river of North America, which runs into the Mississippi; N. lat. $42^{\circ} 32'$. W. long. $92^{\circ} 3'$.

OOKATA, a town of Japan, in the island of Ximo; 28 miles S. of Funai.

OOKI, a town of Japan, in the island of Ximo; 54 miles N. of Nangafaki.

OOLANDOR, a town of Hindoostan, in the Carnatic; 20 miles W.S.W. of Trivadi.

OOLPAR, a town of Hindoostan, in Guzerat; 10 miles W. of Surat.

OOMKOO, a mountain of Asia, between Bootan and Bengal, N. of Buxadewar. It is higher than the Peachukom mountain, covered to its summit with trees, all clothed with moss, and with creepers intertwined among them, of surprising length and thickness, and not less remarkable for their flexibility and strength; qualities which render them an excellent substitute for rope, the use of which they entirely supersede. This mountain is composed in some places of clay; but for the most part it consists of a flinty stone, striated with talc and intermixed with marble. It produces a great quantity of bamboo, which is very hollow, and smaller than that of Bengal, having its shoots at a greater distance from each other, and growing to full maturity in one season. Its leaves are very large, and are gathered as food for their horses instead of grass: clusters of plaintain trees were not uncommon. On one declivity of this hill is a sacred spot called "Sheenshilla," dedicated to a deity of the same name. Turner's Tibet, p. 45.

OONALASHKA, UNALASHKA, or *Agun-Alashka*, an island in the North Pacific ocean, separated from the continent of North America by a channel in the direction of N.W. by N. This is one of the "Fox islands," and supposed to be the largest of them, and to contain several thousand inhabitants. (See *Fox Islands*.) The houses of these islanders are tents, like those in Kamtschatka, with an entrance by a hole in the middle of the roof. In one of these several families reside, including thirty or forty persons: they keep themselves warm by means of whale fat, burnt in shells and placed between their legs: the women sit apart from the men; and six or seven of these tents, called "Yours," compose a village, of which there are sixteen in Oonalashka. As their habitations are dark, they perpetually use, in winter, a sort of large lamp, hollowed in a stone, into which they put a rush-wick, and burn train oil. The inhabitants are white, with black hair, having flat faces and being of good stature: the men shave with a sharp stone or knife the circumference and top of the head, and the remaining hair is left to hang from the crown. The women cut their hair in a straight line over the forehead, tying it behind, when it is of considerable length, in a bunch. Some of the men wear their beards, and others shave or pull them out by the roots. They mark their faces, the backs of their hands, and lower parts of their arms, with various figures, by pricking them first with a kind of needle, and afterwards rubbing the parts with black clay. In the lower lip they make three incisions;

placing in the middle one a flat bone, or coloured stone; and in each of the side slits they fix a long pointed piece of bone, which bends and reaches almost to the ears. They likewise make a hole through the gristle of the nose, into which they put a small piece of bone, so as to keep the nostrils extended. They also pierce holes in their ears, and wear in them any small ornaments which they can procure. Their dress consists of a cap and fur-coat, which extends down to the knee. Some wear caps of a party-coloured bird-skin, upon which is left part of the wings and tail. On the forepart of their hunting and fishing caps, they place a small board like a screen, adorned with the jaw-bones of sea-bears, and ornamented with glass beads, which they procure in barter from the Russians. At their festivals and dancing parties, they use a more showy sort of cap. Their coats are made and worn like shirts. The dress of the men is made of bird-skins, that of the women of sea-otters and sea-bears, neatly sewed with sinews, and ornamented with stripes of sea-otter skins and leather fringes. They have also upper garments made of the intestines of the largest sea-calves and sea-lions. Their vessels are of two sorts: the larger being leather boats, or "baidars," with oars on both sides, and capable of holding thirty or forty people: the smaller vessels are rowed with a double paddle, and contain one or two persons: they are a mere skeleton of a boat covered with leather, and yet they pass in them from one island to another, and venture out to sea to a considerable distance. In calm weather they go out to catch turbot and cod with hooks, and lines made with sinews or feathers. Unsupplied by the fish and game they take with sufficient sustenance, their food consists of sea-wrack and shell-fish, which they find on shore. They generally eat the flesh of all sea-animals raw; and if they dress it they place it between two stones, stopping the interstices with lime or clay, and kindle a fire under it. Their provisions they keep undried without salt in the open air. They gather berries of various sorts, and the root of the facanas, which grows wild at Kamtschatka. They have not learnt the art of distilling brandy or any other strong liquors from the cow-parasit; they are fond of snuff, with which the Russians supply them. Marriage ceremonies are unknown, but each man takes as many wives as he can maintain, generally four. Their weapons consist of bows, arrows, and darts; for defence they use wooden shields, called "kayaki." Although savages, these islanders are very docile. The Russians have for some years repaired to these islands for furs, of which they have imposed a tax on the inhabitants. Besides this tax they demand, in return for the fox-traps and skins with which they supply them, furs and provisions for the winter; for the rest they pay in beads, false pearls, goats' wool, copper kettles, halibets, &c. Capt. Cook and Capt. King visited this island in the year 1778: the inhabitants seldom came to the ships, and did not remain above a quarter of an hour at a time, bartering a few articles with the seamen, but appearing to avoid much intercourse. They are said to have behaved with a degree of politeness uncommon with savage tribes. Several of the natives bartered a few fishing implements for tobacco. The ships excited their curiosity, though they did not appear to be altogether strangers to Europeans: such of them as could not come off in canoes, assembled on the hills to look at them. They were observed to eat raw fish. N. lat. $53^{\circ} 45'$ to 54° . E. long. $191^{\circ} 20'$ to 192° .

OONATO, a town of Japan, in the island of Nippon; 120 miles N. of Jedo.

OONDAPATTY, a town of Bengal, in Baglana; 15 miles S. of Nausluch.

OONELLA, one of the Fox islands, about 7 leagues in circumference, near the mouth of Samganoodha harbour in Oonalashka. The island of Acootan, E.N.E. of it, is considerably larger, and has several high mountains. See ACOOTAN.

OONEMAK, OONIMAK, or *Unimak*, one of the Fox islands, between Oonalashka and Alashka, about 200 miles in circumference. N. lat. $54^{\circ} 30'$ to $55^{\circ} 15'$. E. long. $194^{\circ} 30'$ to $196^{\circ} 40'$.

OONEMAK, *Cape*. See ONEMACK *Point*.

OONGONDA, a town of Hindoostan, in Golconda; 35 miles S. of Combamet.

OONIARA, a large town of Hindoostan, on the route from Agra to Oujein, surrounded by a wall partly of mud, partly of stone. Within the stone inclosure is a handsome house of the rajah: around both walls runs a ditch. The rajah is a feudatory of the rajah of Jynagur, to whom a tribute is paid of 35,000 rupees to the Siccar, and 5000 to the officers of government.

OONO, a town of Japan, in the island of Ximo; 25 miles W. of Funai.

OOOA, one of the small Friendly islands; 12 miles N.E. of Annamooka.

OOREY, a town of Hindoostan, in the circar of Gohud; 20 miles S.S.W. of Calpy.

OORGAUM, a town of Hindoostan, in Dowlatabad; 15 miles E.N.E. of Amednagur.

OORITCHYCOTTAMALLY, a town of Hindoostan, in Baramaul; 12 miles W. of Sankeridurgam.

OOROO, a kind of cloth made by the people of Otaheite, and of other islands in that neighbourhood, from the bark of the bread-fruit tree: the process of its manufacture has been explained under the word AOUTA, which is a name given in those countries to another kind of cloth, made of the bark of the paper-mulberry tree, precisely after the same manner.

OORT, ADAM VAN, in *Biography*, was a painter of the Flemish school, who enjoyed considerable reputation, but is made most remarkable by having had the honour of initiating the uncommon genius of Rubens in the art he practised.

He was born at Antwerp in 1557, and was the son of Lambert Van Oort, a painter of perspective and architecture. Adam soon left his father's humble walk, and attempted history and portrait painting with success; but he neglected the simplicity of nature, and having genius sufficient to invent a system of his own, too closely followed it to the loss of just feeling and propriety.

It was not only in his painting that he was a mannerist, but also in his disposition; by the rough and unamiable humour of which, he lost his friends and lived unhappily. Jordaens, who married his daughter, and who probably by his affection for her was induced to tolerate the rudeness of Van Oort's manners, was the only one of his numerous pupils who did not desert him: yet he lived to the great age of 84, dying in 1557.

OOSCOPIA, *ωοσκόπια*, in *Antiquity*, a species of divination, wherein predictions were made from eggs.

OOSI, in *Geography*, a town of Japan, in the island of Nippon; 24 miles N.N.W. of Morisa.

OOSIMA, a small island of Japan, near the S. coast of Nippon. N. lat. $34^{\circ} 26'$. E. long. $139^{\circ} 25'$.

OOST, JACOB VAN, in *Biography*, a Flemish painter, born at Bruges about 1600, who travelled to Italy, and studying with great attention the works of Annibal Carracci, succeeded in imitating his style of design in such a manner as frequently to deceive. He died in 1671.

Oost, *Oast*, or *Oust*, in *Husbandry*, a name given by the

people who manure hops, to the kiln in which they dry them, after they are picked from the stalks. This is a square room, built up of brick or stone, ten feet wide, more or less, and having a door on one side. In the midst of this room is a fire-place, about thirteen inches wide, and as much high, and, in length, reaching from the mouth so nearly to the back part of the kiln, that a man has just room to go round it. This fire-place is called a *herse*, and the fire is let out into the room by several holes in the sides, in the same manner as in malt-kilns. Five feet above this is laid the floor, on which the hops are to be laid to dry; and this must have a wall round it of four feet high, to keep the hops from falling out. At one side of the upper bed must be made a window by which to push out the hops, as they are dried, into the room prepared for them. The beds must be made of laths an inch square, placed at a quarter of an inch distance from one another, and supported by beams underneath. The hops are to be poured on this bed with a basket, till the whole is covered half a yard thick with them; when this is done, lay them even with a rake, and let a fire be made in the fire-place below. Some recommend a wood fire, but experience shews, that nothing does so well as charcoal; let the fire be kept at the mouth of the furnace, for the air will be carried all the way through; and thus let the hops lie, never stirring them till they are thoroughly dry; when they rattle under the rake, and the inner stalks are brittle, they are sufficiently dried, and are to be pushed out, and a fresh parcel laid in the oost in their place.

The kilns for drying hops are built with fire-places, in the nature of malt-kilns; and at a proper distance over the fire is an hair-cloth strained upon laths; and thereon the hops are laid and raked even, to the depth of about six or seven inches, for the better convenience of drying them equally; and when they are properly cured on the under side, they are carefully turned; and by that means the upper side becoming the under, the whole shares the fire alike. The person that performs this part is called the dryer, whose business it is to manage the fires. The fuel commonly made use of is charcoal, on account of its freeness from smoke, and affording a steady heat. Great nicety is required in this part; a small fire being to be made at first, that they may heat gradually, and so raised as they dry, that it may be done without scorching; and the fire is to be lowered by degrees, against they are ready to be taken off: the time required is about eight hours. From charcoal being dear, many people have adopted the method of drying with sea-coal, upon what they call cockle-ousts, which are square iron boxes placed upon brick-work, and a flue and chimney in the back part of the building for the smoke to go off. The computation is, that a chaldron of sea-coal, at about twenty-four shillings, will dry a load of hops, and that a load of charcoal will do no more. It is indeed expensive to erect such ousts, as there must be no timber near them; and an iron beam and iron laths are to be used, and they covered with plates of tin or iron properly fastened together. See TIN-floor.

But a new method of drying hops with sea-coal or any kind of fuel whatever, by means of a moveable iron furnace, has lately been invented: it is in the form of an horizontal cylinder, stopped at both ends: it lies on an iron carriage, which rolls on four iron wheels; in the fore end of the cylinder is the furnace door; and a hollow iron flue runs in an horizontal direction along the upper surface of the cylinder from the back, till it reaches the fore end of it, when it takes a vertical direction, and is carried as high as is necessary to convey the smoke out of the oust. It is a sort of rolling furnace.

OOST-

OOSTBOURG, in *Geography*, a town of France, in the department of the Scheldt, and chief place of a canton, in the district of L'Ecluse. The place contains 793, and the canton 4903 inhabitants, on a territory of 110 kilometres, in seven communes.

OOSTERADE, a town of the duchy of Holstein; seven miles E.N.E. of Itzchoa.

OOSTERDYKIA, in *Botany*. See **CUNONIA**.

OOSTERHOUT, in *Geography*, a town of Brabant; six miles N.E. of Breda.

OOSTERWYCK, a town of Brabant; seven miles S.W. of Bois le Duc.

OOSTERZEELE, a town of France, in the department of the Scheldt, and chief place of a canton, in the district of Ghent. The place contains 2740, and the canton 19,436 inhabitants, on a territory of 110 kilometres, in 19 communes.

OOST-ROOSBECKE, a town of France, in the department of the Lys, and chief place of a canton, in the district of Courtray. The place contains 3540, and the canton 11,990 inhabitants, on a territory of 57½ kilometres, in eight communes.

OOTAGAMIS, **UPPER**, a town of America, on the river Ooifconfin, about 40 miles from the Mississippi. N. lat. 42° 42'. W. long. 91° 8'. The *Lower Ootagamis* lies at the conflux of the two forementioned rivers.

OOTAMA SCHOLAPERAM, a town of Hindoostan, in Myfore; nine miles S.E. of Wombinellore.

OOTAMALLY, a town of Hindoostan, in Coimbatore; 30 miles S.S.E. of Coimbatore.

OOTATORE, a town of Hindoostan, in the Carnatic; 22 miles N.W. of Tanjore. N. lat. 11° 2'. E. long. 78° 58'.

OOTAWAS. See **OTTAWAS**.

OOTERAWOODY, a town of Hindoostan, in Coimbatore; seven miles N. of Daraporum.

OOTIAMPALIAM, a town of Hindoostan, in the country of Dindigul; 50 miles S.S.W. of Dindigul.

OOTIAMPALIAM, *Valley of*, a territory of Hindoostan, enclosed between the branches of the Gauts, on the western side of the peninsula, and extending 14 or 15 miles between the termination of the northern Gauts and the commencement of the southern ones from Paniany to Coimbatore, before it opens finally into the low country on the Malabar coast. As it is well known, that ships which navigate this coast during the N.E. monsoon, commonly experience a stronger gale in the neighbourhood of Paniany than elsewhere, major Rennell is of opinion, that this opening in the Gauts is a very sufficient cause for such an effect; and as the lower part of the Coimbatore country partakes of the rainy or S.W. monsoon of the Malabar coast, this may be referred to the same cause.

OOTORI, a town of Japan, in the island of Nippon. N. lat. 34° 26'. E. long. 136° 40'.

OOTSOUR, a town of Hindoostan, in Myfore; 30 miles E. of Rettinghery.

OPACITY, in *Philosophy*, a quality of bodies which renders them opaque; that is, impervious to the rays of light.

The term *opacity* is used in opposition to *transparency*.

Opacity, according to the Cartesians, consists in this; that the pores of the body are not all straight, or directly before each other; or rather not pervious every way.

But this doctrine is deficient: for though it must be allowed, that, to have a body transparent, its pores must be straight, or rather open every way; yet how it should

happen, that not only glass and diamonds, but even water, whose parts are so very moveable, should have all their pores open and pervious every way; and, at the same time, the finest paper or the thinnest gold plate should exclude the light, for want of such pores, is inconceivable. So that another cause of opacity must be found. Now all bodies have vastly more pores or vacuities than are necessary for an infinite number of rays to find a free passage through them in right lines, without striking on any of the parts themselves: for since water is nineteen times lighter, *i. e.* so much rarer than gold; and yet gold itself is so very rare, that magnetic effluvia pass freely through it, without any opposition; and quicksilver is readily received within its pores, and even water itself by compression; it must have much more pores than solid parts; consequently, water must have at least forty times as much vacuity as solidity.

The cause, therefore, why some bodies are opaque, does not consist in the want of rectilinear pores, pervious every way; but either in the unequal density of the parts, or in the magnitude of pores, and their being either empty, or filled with a different matter; by means of which, the rays of light in their passage are arrested by innumerable refractions and reflections, till, falling at length on some solid part, they become quite extinct, and are utterly absorbed.

Hence cork, paper, wood, &c. are opaque; while glass, diamonds, &c. are pellucid. For in the confines or joining of parts alike in density, such as those of glass, water, diamonds, &c. among themselves, there arises no refraction or reflection, by reason of the equal attraction every way; so that, such of the rays of light as enter the first surface, pass straight through the body, excepting such as are lost and absorbed, by striking on solid parts; but in the bordering of parts unequal in density, such as those of wood and paper, both with regard to themselves, and with regard to the air or empty space in their larger pores, the attraction being unequal, the reflections and refractions will be very great: thus the rays will be unable to pass through such bodies, being continually driven about, till they become extinct.

That this interruption or discontinuity of parts is the chief cause of opacity, sir Isaac Newton argues, does appear hence; that all opaque bodies immediately begin to be transparent, when their pores become filled with a substance of equal, or almost equal, density with their parts. Thus paper dipped in water or oil, the stone called *oculus mundi* steeped in water, linen-cloth dipped in oil or vinegar, and other substances soaked in such fluids as will intimately pervade their little pores, become more transparent than before.

On the contrary, the most transparent substances, by emptying their pores, or separating their parts, may be rendered very opaque. Thus salts, or wet paper, or *oculus mundi*, by drying; horn, by scraping; glass, by pulverising, or flaking; and water itself, by being beat into bubbles or froth; are rendered opaque.

Indeed, to render bodies opaque, and coloured, their interstices must not be less than of some determinate size; for the most opaque bodies that are, if their parts be very minutely divided, as when metals are divided in acid menstrua, become perfectly transparent. See **TRANSPARENCY**.

OPAH, or **KING-FISH**, in *Ichthyology*, a species of fish common on the coast of Guinea; it is smooth-skinned, without scales or teeth; it has one erect fin to its back, which rises below its neck, and reaches almost to its tail; there is also on each side, behind the gills, a fin; and a pair of fins a little before the vent under its belly; from behind the vent runs one fin within a little of the tail; and the tail-fin is large

large and forked; the eyes of this fish are large, the irides scarlet, encompassed with a circle of a gold colour, verged with scarlet; its nostrils are placed above its eyes; the upper part of the body is of a dark blue, or violet colour; this, and the sides which are of a bright green, are speckled with oblong white spots; the chaps of a pale red; the nose, gills, and belly of a silver colour; and all the fins of a bright scarlet; the mouth is small, the tongue thick, and resembling a human tongue, but thick-set with prickles, which are pointed backwards, and which seem to serve instead of teeth for retaining its prey or food. The fish from which this description is taken, was three feet seven inches long, and three feet ten inches round in the thickest part, and weighed eighty-two pounds; the flesh of the fore-part was firm, and had the appearance of beef, and the hinder part like fine veal. *Phil. Trans.* vol. xlv. p. 518. or *Abr.* vol. xi. p. 879.

OPAL, OPALUS, in *Natural History*, a precious stone, of various colours; changeable according to the different position of the stone to the light.

It is generally classed among the siliceous earths, or finer flints, although some specimens are so soft as to be capable of being scratched with a knife. M. Chaptal considers the opal as a semi-transparent agate of a milky whiteness, exhibiting a glittering, changeable, internal colour, of a blue, red, and green tinge. That which comes from Hungary has a kind of greyish clay for its gangre. The most beautiful opal is the oriental; sometimes called the spangled opal, because its colour appears like equal spots distributed over its whole surface. These opals have received various names, according to the colours they reflect. The chatoyant stones, or such as vary their colour according to the position of the light, and the eye of the observer, are varieties of the opal; such are the girasol, cat's-eye, and fish's-eye. The reflected rays of the girasol are weak, blueish, and mixed with an orange yellow. This stone has been found in the lead mines of Chatelaudren in Brittany. The most obvious character of the girasol is, that it exhibits in its internal part a luminous point; and reflects the rays of light in whatever position it may be turned, when it is cut into a globe or hemisphere. The fish's-eye does not differ from the *Cat's-eye* (which see,) except in its colour, which is blueish: it is found at Java. See GEMS.

Of opal there are four sub-species, *viz.* the noble opal, infusible before the blowpipe, sp. grav. 2.114, and composed of 90 flx and 2 of water; common opal, infusible without addition before the blowpipe, sp. gr. 1.95 to 2.01, one specimen composed of 98.75 flx, 0.1 alumine, 0.1 oxyd of iron, 0 water; and another consisting of 93.5 flx, 0 alumine, 1 oxyd of iron, and 5 water; semi-opal, infusible in the furnace, sp. gr. 2.54, composed in two specimens of 43.5, or 35.5 flx, 0 or 1 alumine, 47. or 0.5 oxyd of iron, 0 or 0.5 lime, and 7.5 or 11.0 water; and wood opal, sp. gr. 2.6, appearing to be wood penetrated with opal.

To imitate this gem in natural crystal use the following method: take yellow orpiment, and white arsenic, of each two ounces; crude antimony, and sal ammoniac, of each one ounce: powder all these, and mix them well together; put this powder into a large crucible, and lay upon it small fragments of crystal, and, upon these, other larger pieces of crystal; fill up the crucible with these, and lute on to it another crucible inverted, with a hole at the bottom as big as a small pea; when the lute is dry, set the vessel in a quantity of charcoal in a large chimney, covering them up with coals to the middle of the upper crucible: so long as the materials fume out at the hole, keep up a strong fire; when that is over, let the fire go out of itself; and then unlute

the crucibles; the greatest part of the crystal will be found tinged to the colours of various gems; not only the opal, which will be very fair and beautiful, but the topaz and ruby colour will be seen in others.

A composition of semi-transparent white glass and paste, resembling the opal, may be formed by taking of the composition for hard GLASS, or PASTE, described under those articles, ten pounds; and of horn, bone, or ivory, calcined to a perfect whiteness, half a pound: grind them well together, and fuse them with a moderate heat. See art of imitating gems under the article GEMS.

OPALIA, in *Antiquity*, feasts celebrated at Rome in honour of the goddess Ops.

Varro says, that they were held three days after the expiration of the Saturnalia: according to Macrobius they were held on the nineteenth of December, which was one of the days of the Saturnalia. He adds, that those two feasts were celebrated in the same month, because Saturn and Ops were husband and wife; and that it is to them we owe the invention of corn and fruits: for which reason, the feast was not held till the harvest and fruit-time were entirely over.

The same author observes, that the vows offered to the goddess were made sitting on the ground; to shew, that she was earth, the mother of all things.

OPALIN. See MAGNESIA *Opalina*.

OPALINKA, in *Geography*, a town of the duchy of Warsaw; 2 miles W. of Polen.

OPARO, an island in the Pacific ocean, discovered by Capt. Vancouver in December 1791. Southward of the N.W. point is a small bay, with a strong beach, through which was the appearance of a considerable stream of water falling into the sea. The shores were so smooth, that landing might have been effected without difficulty. Round to the N. of that point is a small bay, in which are a small islet and some rocks, behind which the shore may be very easily approached at any time. The S. extremity of the island appeared, in some points of view, to form a right angle, without the least interruption in its sides; about half a mile to the S.E. is a small detached islet; the shores are interspersed with sandy beaches; its greatest extent, in a N. 18° W. and S. 18° E. direction, is about 6½ miles, and it may possibly be about 18 in circumference. Its principal character is a cluster of high craggy mountains, forming, in several places, most romantic pinnacles, with perpendicular cliffs, nearly from their summits to the sea; in the intermediate chasms there was no appearance of fertility or cultivation; they were chiefly clothed with shrubs and dwarf trees. The tops of six of the highest hills appeared like fortified places, resembling redoubts, having a fort of block-house, like an English glass-house, in the centre of each, with rows of palisades, for a considerable way down the sides of the hills, nearly at equal distances. These seemed to be intended for advanced works, and apparently capable of defending the citadel by a few against numerous assailants. On all of them people were observed, moving about as if on duty. These buildings were large enough to contain a considerable number of persons, and they were the only habitations that were observed. Capt. Vancouver saw about 30 double and single canoes, neatly constructed, though very narrow. The island did not appear to afford any large timber, the broadest planks of which the canoes were made not exceeding 12 inches. The total number of inhabitants on the island was estimated at not less than 1500. The natives appeared, notwithstanding the uncultivated state of the island, to be exceedingly well fed, of middling stature, very well made, with countenances open, cheerful, and indicating hospitality. Their hair was cut short, and they were

were entirely without cloathing. None of them appeared to be tattooed. S. lat. $27^{\circ} 36'$. E. long. $215^{\circ} 58'$.

OPATCHIN, a town of Kaintschatka; 30 miles from Bolchoretsk.

OPATOW, a town of Poland, in the palatinate of Sandomirz; 16 miles W.N.W. of Sandomirz.

OPATRUM, in *Entomology*, a genus of insects of the order Coleoptera, the generic character of which is: Antennæ moniliform, thicker towards the tip; the head is projecting from a cavity in the thorax; the thorax is a little flattened, and margined; shells emarginate, longer than the abdomen. There are twenty-eight species scattered over the globe, one of which only is common to our own country, to Europe at large, and to America.

Species.

GRISEUM. Cinereous; thorax plane; shells with three raised lines, toothed behind. It inhabits Italy, and is larger than the Sabulofum.

PORCATUM. Grey; thorax plane; shells grooved, with raised black dots between the grooves. It inhabits Barbary.

***SABULOSUM**. This is a brown insect; the shells have three indented raised lines; the thorax is emarginate. It inhabits Europe and America.

GIBBUM. Black; shells with numerous obsolete raised lines. It inhabits Sweden, on sand banks.

LÆVIGATUM. Black; the shield is pitchy before; the shells are substriate. It inhabits New Holland.

CRENATUM. Black; thorax with a crenate edge, the fore angle projecting, the hind one spinous; shells with crenate striæ. It inhabits Sweden, on sandy plains.

GLABRATUM. Black; thorax and shells smooth and cinereous. It is found in the East Indies, and is the size of the Sabulofum.

ARENARIUM. Grey; shells striate. It is found at the Cape of Good Hope.

CLATHRATUM. Black; shells with punctured striæ. It inhabits Cayenne.

PLAGUM. Depressed, black, opaque; shells striate, smooth. It inhabits Siberia.

GRANULATUM. Black; edge of the thorax somewhat reflected; the shells have three raised lines, the interstices punctured. It inhabits the sandy plains of Barbary.

ORIENTALE. Cinereous; thorax and shells rugged; fore-shanks dilated, triangular. It is found in the sandy plains of the East.

TIBIALE. Black; shells punctured, a little rugged; fore-shanks two-toothed at the base.

AGRICOLA. Black; thorax smooth; shells striate. It inhabits Germany, and is a very small insect.

MINUTUM. Cinereous; thorax rough; shells with four raised lines. It is found in Sweden, and is very small.

PUSILLUM. Cinereous, thorax rough; shells with many striæ. It is small and inhabits Hungary.

QUISQUILIARUM. Black; thorax granulate, smooth in the middle; shells very smooth.

CINEREUM. This is black; clouded with cinereous; the shells have punctured grooves. It inhabits India.

MELINUM. Ochraceous, smooth; thorax and shells faintly punctured. It is found in Germany, and is thought not to belong to this genus.

CINETERIUM. Bay, elongated; shells flat, very smooth. It inhabits Pomerania.

BIPUSTULATUM. Ferruginous; shells faintly grooved. This also is found in Pomerania.

LITHOPHILUS. Black, beneath scarlet; thorax scarlet,

emarginate, pointed at the corners behind; the shells are very smooth; the tarsi are three-jointed. It inhabits Germany, and like the Melinum is of a doubtful genus.

MONILICORNE. Brown; thorax and shells villous. It inhabits Germany.

SILPHOIDE. Black, smooth; thorax dilated backwards; shells with punctured striæ and two fulvous bands. It is found on the oak fungus.

UNIPUNCTATUM. Brown, hairy; thorax sub-cylindric, emarginate, with a hollow in the middle; the two last joints of the antennæ distant and larger.

BIPUNCTATUM. Brown; thorax sub-cylindric, emarginate, with two hollows; the two last joints of the antennæ distant and larger.

TESTACEUM. This is a testaceous insect; the eyes, thorax, shells, and antennæ are brown, the latter rufous at the base and tip; shells with a large testaceous lunule at the base; thorax with two impressed dots. It inhabits Europe; shells punctured and striate.

BRUNNEUM. Reddish-brown with yellow down; shells faintly punctured striate, with six yellow spots; antennæ and legs pale yellow.

OPDAELSCHOW, in *Geography*, a town of Norway, in the province of Drontheim; eight miles S.W. of Drontheim.

OPDAL, a town of Norway, in the province of Drontheim; 54 miles S. of Drontheim.

OPE LAND, in *Agriculture*, provincially ground that is loose or open, from its being ploughed up every year, or kept in constant tillage.

OPECKON, in *Geography*, a creek of America, in Virginia, the water of which is discharged into the Patowmac river. N. lat. $39^{\circ} 30'$. W. long. $77^{\circ} 52'$.

OPEGINSKAIA, a town of Russia, in the government of Novgorod, on the river Mota; 60 miles E. of Novgorod.

OPEGRAPHA, in *Botany*, so named from *ορνη*, a *chink* or *cleft*, and *γραφω*, to *write* or *engrave*, in allusion to the nature of the fructification, which resembles Hebrew or Oriental characters on a white or pale ground; whence one species, and indeed many long confounded under it, obtained the appellation of *Lichen scriptus*, from Linnæus and his followers.—Perfoon in *Ult. Annal. fasc. 11. Ach. Prodr. 19. Meth. 16. Lichenogr. 244. Sm. in Engl. Bot. 1753.*—Class and order, *Cryptogamia Algæ. Nat. Ord. Algæ, Linn. Juss. Lichenes, Achar.*

Ess. Ch. Seeds in black, linear, sessile, simple or branched, bordered clefts, in an uninterrupted crust.

No genus among the whole tribe of Lichens, now become a natural order, can be more clearly distinct than this. The *clefts*, technically so called, are a peculiar sort of fructification, differing from the shields or tubercles of a *Lichen*, in their indefinitely oblong or linear form, and frequently branching nature, which last property seems a consequence of the former. Their linear disk, more or less intensely black, is accompanied at each side by a parallel elevated border, sometimes attended, rarely supplanted, by an accessory border from the substance of the crust. These *clefts* are sessile on, or sometimes sunk into, a continued crust, various in thickness, either membranous or chalky, mostly white or pale, with a border more or less distinctly marked. The crust spreads in patches, generally over the smooth bark of trees, to which it is closely united, being rarely found on stones or walls.

Twenty-nine species of *Opegrapha* are defined in the *Prodromus* of Acharius, as a section of the great genus *Lichen*; in his *Methodus*, where *Opegrapha*, like the rest of those sections,

fections, is raised to the rank of a genus, they are reduced to 24, nor does the supplement to that work contain any new ones. In the more recently published *Lichenographia* of the same writer, we find 29 *Opegrapha*, besides eight species under a genus separated therefrom by the name of *Graphis*, which appellation Adanson originally gave to the whole, and it was retained by Ehrhart. There is moreover one species of each in the addenda.

The *Graphis* of Acharius is characterised by having the *clefts* sunk into the crust, and their disk naked, not covered by a black membrane; but the latter distinction seems to us very obscure at least, if not evanescent. There is certainly no natural difference or appearance to countenance this separation.

Although some species of *Opegrapha* are defined with simple, and others with branched, *clefts*; even that difference is not invariable, examples of both being not unfrequent in the same individual, among the smaller less specious kinds. Acharius has therefore, in his last work, laid it aside, distributing the species according to the comparative breadth of their disk.

The following examples may suffice.

O. herpetica. Eruptive *Opegrapha*. Ach. Lichenogr. n. 6. Meth. 23. Engl. Bot. t. 1789.—Crust tumid and somewhat rugged, brownish olive grey. Clefts prominent, crowded, simple, oblong, convex, irregular.—Found by professor Swartz in Sweden, and by Mr. Turner near Yarmouth, on the barks of trees. The uneven dirty olive crust distinguishes this species, which is one of the least ornamental or attractive. The *fructification* is crowded over the surface, in little, coal-black, tumid, irregularly oval, wart-like *clefts*, very rarely cloven, never properly branched.

O. Lyelli. White-bordered *Opegrapha*. Engl. Bot. t. 1876.—Crust smooth, membranous, pale olive. Clefts prominent, turgid, crowded, curved, obtuse, greyish and powdery, with an elevated, white, powdery border.—Discovered by Charles Lyell, esq. on the rugged bark of trees in the New Forest, Hampshire; It seems unknown to Acharius. The *crust* is very smooth, waxy in appearance, of an uniform pale olive green, and almost horny texture. The *clefts* are numerous and crowded, mostly simple, various in length, curved, obtuse or rounded at each end, very prominent; their disk broad and convex, black, but clothed with greyish powder; their border very peculiar, originating from the crust, but white, powdery, and very thick.

O. elegans. Elegant Grooved *Opegrapha*. Engl. Bot. t. 1812.—Crust orbicular, granulated, white, somewhat shining. Clefts immersed, scattered, divaricated, mostly simple, with a grooved border.—This species, likewise, it seems, unknown to Acharius, was found by Mr. W. Borrer, on the smooth barks of young trees in Suffex. Its peculiar character consists in the proper border of the *clefts* being as it were double, divided by a longitudinal line or furrow, and there is a slight accessory border, from the crust, besides. The *crust* is white and rather shining, all over granulated with regular minute prominences, but not mealy.

O. scripta. Black-letter *Opegrapha*. Ach. Meth. 30. Engl. Bot. t. 1813. (*Graphis scripta*; Ach. Lichenogr. 265. Lichen scriptus; Ach. Prodr. 25. Linn. Sp. Pl. 1606. Lichenoides crustâ tenuissimâ, peregrinis velut litteris inscriptâ; Dill. in Raii Syn. 71. Musc. 125. t. 18. f. 1 ?)—Crust thin, membranous, shining, smooth, greenish-white, bordered with black. Clefts immersed, smooth, linear, slightly zigzag, simple, or much branched in a parallel direction.—Not uncommon on the even bark of trees in woods. The *crust* is broad and thin, of a greenish or brownish-white, with a blackish edge. *Fructification* scat-

tered, strikingly resembling Hebrew or Chinese characters, which resemblance is caused by the parallel, as well as frequently rectangular, direction of the numerous and various branches of the black linear *clefts*. Their disk is paler than their borders, and esteemed by Acharius to be naked. He enumerates five varieties of this species. Some of the *clefts* are simple, but they are always accompanied by such as are much branched.

O. dendritica. Tree-like *Opegrapha*. Ach. Meth. 31. t. 1. f. 10. Engl. Bot. t. 1756. (*Graphis dendritica*; Ach. Lichenogr. 271.)—Crust tartareous, determined, very white and somewhat powdery. Clefts immersed, depressed, without any elevated border, repeatedly branched, zigzag, tapering at each end.—Found in the south part of England, by Mr. W. Borrer and Mr. Lyell, growing on the smooth bark of trees. The same, or a slight variety, was gathered in Spain, by Schouboe. This is a most elegant plant. The cream-coloured, rather mealy, *crust* forms roundish patches, whose middle part principally is occupied by copious branched zigzag *clefts*, of a greyish-black, taper-pointed at each end, and spreading concentrically as it were toward the margin, which however they do not reach. They have no proper elevated border of their own substance, but the crust is slightly tumid at each side.

O. afroidea, Ach. Meth. 25. Engl. Bot. t. 1847, is now removed to the newer genus *Arthonia*, in Ach. Lichenogr. 144, where it makes the variety β of *A. radiata*.

OPEN, in *Geography*, a town of Prussia, in Ermeland; 14 miles W. of Heilsberg.

OPEN, the situation of a place exposed to the wind and sea. It is also expressed of any distant object to which the sight or passage is not intercepted.

OPEN, in *Rural Economy*, a term sometimes applied to cows or heifers, signifying that they are not in calf.

OPEN Cuts, in *Agriculture*, such drains or gutters as are made in land by the spade, and left without being covered in. They are used in draining lands in particular cases. And Mr. Nicol suggests, "that perhaps open cuts, if effectual, are the best of all for forest draining, as they cannot be inconvenient, from the plough not being employed after the trees are planted."

It is also found that cuts of this sort are frequently useful in the practice of irrigation, watering, and floating.

OPEN-Field Land, that which is in a state of commonage. It has been observed that the open field or uninclosed lands in some parts of the kingdom have undergone very little alteration in regard to the mode of occupation for ages. It is supposed, that to the ancient distribution of manors may be ascribed the origin of what is now known in different parts of the kingdom by the name of open or common field lands, and in Scotland by that of runrig or rudridge. The scattered situation and smallness of the pieces of common field lands, still frequently cultivated by one person, in many instances fifty or a hundred acres situated in nearly as many different places, evince, first, that the mode of division, considering the then state of the nation, was a matter of sound policy, because till about the close of the ninth century, when England was divided into tithings and hundreds, there seems to have been no law but that of the sword for the protection of private property; hence every inhabitant of the parish or township, by having a common interest in the parish fields in case of any invasion, became bound by the strongest tie (self-interest) to associate with his neighbours in order to repel the foe. And in the second place, it is also clear that the occupiers began with cultivating small spots, an acre, or perhaps less, and, as population increased, and bread corn became scarce, they gradually increased their tillage lands. Those

Those parts of the parish which were either unimprovable, or at too great a distance from home, were partly reserved for the purpose of supplying fuel, pit-coal, if at all known, being only in common use in a few places. The remainder was allotted for the common pasturage of the parish cattle, which were by mutual agreement kept there during summer and harvest; after which they were allowed to range over the arable lands till the return of spring.

It ought also to be observed that a certain portion of the manor or estate was set apart for the purpose of producing natural or meadow grafs to be made into hay. This meadow grafs was divided among the farmers, in proportion to the extent of their farms, either by lot or some kind of understood agreement. The cattle were excluded by mutual consent at a certain period in spring, and it remained shut, as it is now termed, till hay harvest was completed, after which the cattle were suffered to pasture during the remainder of the season. It is astonishing that in such a length of time as from the original distribution of manors in England to the present period, so little alteration should have taken place in regard to the mode of occupying those lands which remain in the open or common field state, more especially when it is considered that during this long interval a spirit for agricultural improvement seems at different periods to have become pretty general. In regard to the modes of cultivation which are adopted in respect to them, it is only necessary to remark, that previous to the introduction of turnips and artificial grasses, the almost universal practice was to have three-fourths in grain, and one-fourth in fallow; and although, in some places, alterations have taken place, yet the instances are very rare in which a better system is pursued.

Also the arable lands are divided into four fields as nearly equal as possible, and each of these fields (however many tenants may have an interest in the cultivation) must, by the established rules, be wholly under the same kind of crop. This, added to the practice of pasturing their cattle on commons, will, according to Mr. Donaldson, "for ever prevent the general introduction of artificial grasses, or indeed almost any other species of improvement, till such time as, either by the mutual consent of all concerned, or the intervention of the legislature, the system is entirely abolished."

It is therefore evident, "that the open-field lands, which in some counties amount to above one-third of the whole, are deficient in point of produce at least one half, when compared with that of inclosed lands under proper management. That open or common field husbandry is therefore an obstruction to agriculture, must be generally allowed, and an obstruction so serious in its nature as to create a deficiency, on the supposition of there being one-fourth part of the tillage-land in this country in the open field state, of at least one-eighth of the marketable produce of the country. When this is stated, and when it is further added that no proprietor or tenant of open-field lands can introduce any improvements in the modes of cropping or of general management without the consent of the parish-community of which he is a member, and none that can be binding upon them without an act of parliament, the absurdity of allowing lands to remain in the open field state must appear still more glaring." And "some facts have been brought to light by means of the Board of Agriculture, which, in proof of these assertions, it may not be improper to mention. The report of the county of Buckingham contains the following statement: 'About eighteen years ago, the parishioners came to an agreement, and obtained an act, to lay the small pieces of land together.' One farmer, at that period, had eighteen acres in thirty-one different pieces, and at wide distances from each other. When the division

took place, the balks were, of necessity, ploughed up, by which a great portion of the sheep-pasture was destroyed. It became then expedient, and it was agreed upon at a public vestry to sow clover and turnips as a succedaneum for the balks. Two years since (that is, sixteen years after this arrangement had taken place among the parishioners), one of the farmers, occupying sixteen acres of these common fields, procured in the month of May a large flock of lean sheep, which he turned on the clover crops, being then nearly in bloom, the greater part of which they devoured. Another instance of the impossibility of parishioners being able to arrange any mode by which improvements can be introduced, which individuals are bound to adhere to without the sanction of parliament, is also detailed in the same report, in the following words: The parish of Steeple Claydon contains 2500 acres of strong wet clay. The custom is here, to have one crop and one fallow. About fourteen years ago the proprietors came to an agreement to have two crops and a fallow; but before the expiration of ten years, one of the farmers broke through the agreement, and turned in his cattle among the crops of beans, oats, and barley; in which plan he was soon followed by the rest of his neighbours; and the crops on that part of the field, which, agreeable to the ancient custom, would have been fallow, were in consequence totally destroyed. Farther, "considering the immense national loss arising from so great a portion of the cultivated and cultivable lands in this country remaining in the open field and commonable state, the great additional expence which farmers are liable to in cultivating lands dispersedly situated, and the inferiority of crops reaped from lands, however good in quality, that are subjected to a never-ending rotation of corn crops, it is no wonder that the report of every county in the kingdom should contain an earnest solicitation to the members of the Board of Agriculture, to suggest such measures as are most likely to receive the sanction of the legislature, and to meet the approbation of all the parties concerned, for removing obstacles, which, while they are permitted to exist, must exclude the possibility of improving the agriculture of the country."

But, "to arrange general equitable principles, on which manorial rights can be purchased, and commons divided and rendered private property, and on which likewise proprietors of parishes shall be at liberty to inclose, and to introduce new and better modes of husbandry on their estates, are subjects of infinite importance to the future prosperity of the country; and as such call loudly for the immediate intervention of the legislature."

Here, after stating and obviating the objections which have been stated against the dividing of commons and the inclosing of parishes, and after pointing out the advantages that experience has, in many instances, proved to have resulted from adopting these means of improvement, what appears the most probable way in which they can be generally introduced? But it is suggested the depopulation of the country, which is supposed a necessary consequence of divisions of commons, or inclosing of parishes, is held out as a grand objection against the general adoption of either of these measures. The fact, however, it appears from the Agricultural reports, is quite the contrary; and to those who attempt to argue against facts, it is unnecessary to make any reply. Can those measures tend to the depopulation of the country which have for their object the production in greater abundance of the means by which an increased population can be supported? Has not every farmer the power of cultivating his land to greater advantage when inclosed, or in severalty, than when intermixed with that of others? Can any farmer cultivate his farm to the greatest possible advan-

tage without more than ordinary labour? Does not this necessarily require an additional number of labourers? To all these questions the answers must certainly be in the affirmative. It may be admitted, that the inhabitants of a parish must undergo a very material alteration in their situation in consequence of its being inclosed; yet it does not follow that the depopulation of the country must be the consequence. Though several of those who occupy small farms must necessarily be removed, in order to enable the proprietors to class the lands into farms of a proper size, it is equally obvious, that a new set of people must be introduced; such as hedgers, ditchers, road-makers, and labourers of every sort. This may therefore be called an alteration in the description of the inhabitants, a shifting of population from one parish to another, rather than an expulsion, or a decrease of the number of inhabitants in one particular parish. Were it evident, however, that depopulation was the consequence of inclosing a parish, it will be found that that depopulation does not arise from the circumstance of the parish having been inclosed, but from the total alteration of the system that too commonly takes place in the after-management of the lands. If the lands, in the place of being laid down to grass, as is the prevailing practice, were cultivated in an alternate course of grain and grass husbandry, the number of hands necessary for the cultivation, and for carrying on and following out the various improvements which in such a case would be immediately introduced, would be at least equal, if not greatly superior, to that of the inhabitants at any period while it remained in the common or open-field state.

The next objection against the adoption of either of these measures is, the depriving the commoners of their rights of commonage. This philanthropic argument is apt, with the man of humanity, like Aaron's rod, to swallow up every other that can be urged in favour of the public, or of the other individuals concerned. But let us pause a moment, and inquire what these rights are. It is presumed, after the most minute inquiry, it will be found that the rights of commonage in this part of the country were, as in Scotland, vested originally in the proprietors of the adjoining tillage lands; and that the new claimants of rights of commonage have acquired these rights, such as they are, in almost every instance, through the negligence of the actual proprietors, who allowed these assumed rights to acquire the sanction of the law, in consequence of prescription. That this is the origin of common rights in this part of the kingdom, and that they are more common on the crown-lands, arising from the cause now assigned, 'negligence,' will not be denied. But they are rights; and 'curfed be he that removes his neighbour's land-mark,' is a maxim that ought to be imprinted on the mind of every man. It does not, however, thence follow, that, to accommodate those possessing rights of common, the public, or the principal proprietors, who would be benefited by a division, should sacrifice their interest, should allow the productive powers of these uncultivated wastes to remain dormant, because it is the inclination of those who have thus acquired rights that they should do so; far less does it follow, that, whether these rights have been acquired through legal indisputable title, or through the sufferance of the proprietors of the adjoining estates, the owners of them cannot, on the division of a common, get a full and fair equivalent in property land for their rights of commonage. Whoever would maintain this doctrine, would maintain that the laws of England were framed for the protection of the rights of the rich, but that the poor had no interest in them. The advantages derived by the cottagers, in virtue of these rights, are, for the most part, merely ideal: yet, if ever a division

of the commons in England takes place, it will, for the reasons mentioned above, become the indispensable duty of the commissioners acting in such cases, both in point of humanity and sound policy, to act liberally towards the cottager, and to give him an adequate allowance of property land for his prescriptive rights. Commissioners so acting ought to consider, that in a national view, whether A, B, or C, are the proprietors of these commonable lands, it is a matter of no sort of importance, provided they are once put in the train of improvement, and which can only be done by converting them into property. These commissioners ought farther to consider, that scarcely any sum of money they can award is an adequate compensation for a cottager's right of common. The money may be soon dissipated: but rights of pasturage, or lands in property, are funds more permanent in their natures. When a poor cottager receives a piece of money in compensation for his rights of commonage, which is but too frequently the case under parish inclosure bills, the funds which were allotted for the support of his family, are, as it were, set afloat; and it is a thousand to one if they again settle on any friendly shore. It cannot, therefore, be too often repeated, that there is no compensation a cottager can receive for his right of commonage so just and equitable, or to him and his family so beneficial, as land in property. Another objection to inclosing parishes, or to a division of open fields, lands, or commons, is the expence of the act of parliament necessary to carry either of these measures into effect; and, when completed, to make the arrangement binding upon the parties. It is certainly mortifying to a proprietor that he can scarcely adopt any plan for improving his estate, without paying some hundred pounds to the clerks of parliament for doing nothing but registering the edicts of the legislature; and for doing which, if they are not properly paid from the public funds, they at least ought to be, so as to prevent them from levying a heavy tax on the more enterprising, public-spirited, and praise-worthy individuals of the community. Let litigious people, when they make appeals to the supreme tribunal of the nation, pay what the avarice of the official people may dictate; but let every application for the interposition of the legislative authority to sanction measures calculated to promote the prosperity and improvement of the country, be laid before parliament without fee or reward. The only other objection which is noticed is, that if all the open fields and improvable commons were brought into a state of cultivation, it would materially affect the interest of the owners of the already improved lands. Such a narrow-minded sentiment ought to be treated with silence and contempt, did it not prove that those who are capable of suggesting it were satisfied, that however much individuals might suffer, the interest of the nation at large would be promoted, were every improvable acre in the island in a proper state of cultivation. This being granted, it may be asked, ought the interest of the public to be sacrificed to promote that of a few individuals? But no apprehensions need be entertained on that account. Although 'trifles light as air' seem with such reasoners to have the weight of 'words of holy writ,' yet the judicious and intelligent must be convinced, that while the commerce of Britain keeps on in a progressive state, there is no extent of superabundant produce that can be raised in the island which will not meet a ready sale in some foreign market or other.

In respect to the advantages to be derived from a general division of the commons, and the inclosure of the open-field parishes in this part of the island, although they are numerous, the most important of them are only mentioned. It is only

only in those countries where the means of subsistence can be had in abundance, and on reasonable terms, that population increases with rapidity. In political calculations the riches of a state are estimated by the number of its inhabitants. As these cannot increase to any considerable degree where the means of subsistence are limited, it is evident, that by adopting the measures above-mentioned, by which only a great addition can be made to the national stock of provisions, the state would become richer, as it would then be able to furnish from its own lands the means of supporting an increased population. Besides, were these measures adopted, it is obvious that the national territorial revenue would be to an immense degree augmented; that of this part of the kingdom, in all probability, one-third at least beyond what it is at present. This fact is elucidated by the following extract from the writer's report of the county of Northampton: "The average rent of an acre of open-field land in this district, including the value of the tithes, which may be reckoned at three shillings and sixpence the acre, may amount to eleven shillings and sixpence; while that of an acre of inclosed land (including a similar sum for tithes,) may be reckoned at twenty shillings, which makes a difference of eight shillings and sixpence the acre. There are eighty-nine parishes in this county in the open-field state, which may contain nearly 150,000 acres; the rent which the proprietors therefore lose, by keeping these parishes in the open-field state, may be estimated at upwards of 60,000*l.* a-year; while at the same time an introduction of agricultural improvements is precluded, and consequently an increase of rent on rational principles."

And besides "an increase of population, of the quantity and quality of grain, and of territorial revenue, the improvement of the different species of live-stock is another advantage which uniformly results from inclosing land. The farmer, no longer under the necessity of mixing his herds or his flocks with those of others, is at liberty to pursue such measures as he judges most expedient; and while he purchases tups, bulls, and stallions of the best sort, to improve his flock, he also takes care, by superior cultivation, and a more judicious rotation of cropping than he was before at liberty to adopt, that they shall not be stinted in their growth by the want of provender. Such is the account of the advantages that are likely to result from a general division of commons and the inclosure of open-fields, which the writer, from a careful perusal of the agricultural reports of the different counties of England, and his own general knowledge of the subject, is able to lay before the reader. Experience having proved, in very many instances, that these, and several others of no inconsiderable importance, have actually resulted, it must appear surprising that any peer of parliament should stand up in his place and maintain an opposite doctrine; yet whoever peruses the Parliamentary Register for 1781, will find that this was the case."

OPEN Flank, in *Fortification*, is that part of the flank which is covered by the orillon.

OPEN Fire. See **FIRE**, and **REVERBERATORY**.

OPEN Fountain. See **FOUNTAIN**.

OPEN Hawse. When a ship at her moorings has her cables straight to her anchors, without crossing, she is said to ride with an *open hawse*.

OPEN Pound. See **POUND**.

OPENACA, in *Geography*, a town of Ceylon; 38 miles S. of Candy.

OPENING a Vein. See **PHLEBOTOMY**.

OPENING of Trenches, is the first breaking of ground by

the besiegers, in order to carry on their approaches towards a place. See **TRENCH**.

OPENING of Gates, in *Astrology*, is when one planet separates from another, and presently applies to a third, bearing rule in a sign opposite to that ruled by the planet with which it was before joined.

OPENING the Mouth. See **MOUTH**.

OPENING-Weirs, are a sort of moveable weirs or pens for the waters of rivers that are subject to floods.

OPERA, a dramatic and lyric representation, in which all the fine arts conspire to form a spectacle full of passion, and to excite, by the assistance of agreeable sensations, interest and illusion.

The constituent parts of an opera are the poem, the music, and the decorations. The mind is addressed by the poetry, the ear by the music, the eye by the painting; and the whole ought to harmonize, in order to move the heart, and convey to it at once the impression through different organs. Of these three parts, our subject does not permit us to consider the first and last, but as they are connected with the second; so that we shall immediately proceed to music, the second constituent part.

The art of combining agreeable sounds may be regarded under two different aspects. Considered as an institution of nature, music is confined to the pleasure which results from melody, harmony, and rhythm; such is, in general, the music of the church; such are the airs for dancing, and for common songs. But as an essential part of the lyric scene, of which the principal object is imitation, music becomes one of the fine arts, capable of painting every picture, exciting every sentiment, contending with poetry, giving it new force, embellishing it with new charms, and triumphing over it by enriching it with new beauties and new allurements. The sounds of the *speaking* voice, not being harmonical or sustained, are so evanescent, and move in such small intervals, as not to be appreciable, and consequently can never unite agreeably with the singing voice, and instruments that produce the same intervals; at least in modern languages, too remote from the musical character: for we are unable to understand many passages of the Greeks concerning their manner of reciting, but by supposing their language to be accentuated, that the inflexions of speech in a sustained declamation form among themselves musical and appreciable intervals, so that we may say their theatrical pieces were a kind of opera; and it is even for this reason that we can have no opera properly so called among us. But if the declaiming speech of the Greeks was not tuneful, what effects could be produced by the *Echeia*, or vases tuned to musical intervals, in the theatres of the Greeks, as described by Vitruvius, lib. v. cap. 5?

Thus far Rousseau, whose ideas on the subject are always elegant and ingenious; but we fear they will never be fulfilled, at least in France.

We must now trace the origin of musical dramas, and point out by what gradations they have been brought to the acme of such perfection as they have attained in Italy, Spain, Portugal, Vienna, Dresden, Russia, and London. The annals of modern music have hitherto furnished no event so important to the progress of the art, as the recovery or invention of *recitative*, or dramatic melody: musicians till this period having been chiefly employed in gratifying the ear with "the concord of sweet sounds," without respect to poetry, or aspiring at energy, passion, intellectual pleasure, or much variety of effect. Epic poetry could never derive great advantage from music, or music from epic poetry: so long a poem as the *Iliad*, or *Aeneid*, if we suppose either of them to have been originally sung,

could admit of few embellishments or refinements from lengthened tones; it was the *lyric* poetry of the ancients as well as the *moderas*, consisting of short effusions of passion or sentiment, in various measures, that best exercised the powers of musical expression. That narration which is sung, like the epic poems of the ancients by the original bards, or their dependents the rhapsodists, as well as the historical ballads of later times, must have been set to the most simple and artless melody, or it would have been utterly unintelligible.

Pulci, who is regarded as the Ennius of modern Italy, and the first who attempted an epic poem in the language of that country, is said by Crescimbeni to have sung his "*Morgante Maggiore*," at the table of Lorenzo de' Medici, in the manner of ancient rhapsodists, about the year 1450, by which we may conjecture, that the music was very simple.

As the Orfeo of Politian was certainly the first attempt at the musical drama, which was afterwards perfected by Apostolo Zeno and Metastasio, we shall give the reader a sketch of the fable.

To this drama there is an argument in verse. The piece is in five acts.

Aristæus, a shepherd, the son of Apollo, loved Eurydice, the wife of Orpheus, in so violent a manner, that he pursued her in the fields; and in her flight from him, she was bitten by a serpent, of which she died. Orpheus, by singing, so softened the infernals, that they suffered her to depart, on condition that he would not look behind him. But not obeying this injunction, she was forced back to hell. Upon his great grief, and resolution never to love another female, the Thracian women tore him to pieces.

At the latter end of the 16th century, during all the rage for fugue, elaborate contrivance, and the laboured complication of different parts, without rhythm, grace, melody, or unity of design; the lovers of poetry were meditating the means of rescuing her from musical pedants, who, with a true Gothic spirit, had loaded her with cumbrous ornaments, in order, as was pretended, to render her more fine, beautiful, and pleasing, after having fettered, maimed, and mangled her.

That no musical dramas, similar to those that were afterwards known by the names of operas and oratorios, had existence in Italy before the beginning of the 17th century, seems certain by no mention being made of them in the ample list given by Angelo Ingegneri, 1598, of all that were then known, in his discourse on the representation of dramatic fables and poetry, where he treats of *tragedie, comedie, pastorali, piscatorie, boschereccie*, &c. all declaimed entirely, except the choruses, which seem to have consisted of odes or madrigals, set to music in parts. Music is the *first* consideration in operas and oratorios; but this author says at the end of his book, "I now come to music, the *third* and *last* part of dramatic representations, which, in comedies and pastorals, without choruses, will be used at pleasure, in interludes, between the acts, to relieve the spectators, whose minds may be fatigued by the attention they have bestowed on the fable."

We are often told, however, of musical dramas performed at Rome and Venice, long before this period: and every writer on the subject informs us, that Sulpitius, in his dedication of Vitruvius, speaks of a tragedy that was recited and sung at Rome, under the auspices of cardinal Riario, 1480; that Alfonso della Viola set a drama to music, in 1560, for the court of Ferrara; and that at Venice there was an opera performed for the entertainment of Henry III. of France, at his return from Poland, on the death of his brother Charles IX., 1574, which was set by the famous Zarlino. These, and more, have been confounded by father

Menestrier with the musical dramas of later times, after the invention of recitative, which alone should distinguish the opera and oratorio from every other species of theatrical exhibition; but these early attempts at singing were no more dramatic than a mass, service, full anthem, or madrigal, would be if sung on a stage. Indeed, some of the dramas, which preceded the year 1600, had choruses, and intermezzi in measured music, and incidental songs, like our masques in the reigns of queen Elizabeth and James I., in which, however, the dialogue was all spoken.

Three Florentine noblemen, viz. Giovanni Bardi, count of Verona, Pietro Strozzi, and Jacopo Corfi, of good taste in literature, being discontented with every former attempt at perfecting dramatic poetry and exhibitions, determined to unite the best lyric poet with the best musician of their time; and therefore chose Ottavio Rinuccini and Jacopo Peri, their countrymen, to write and set to music the drama of *Dafne*, which was performed in the house of signor Corfi, in 1597, with great applause; and this seems the true era whence the opera, or drama, *wholly set to music*, and in which the dialogue was neither sung in measure, nor declaimed without music, but *recited* in simple musical tones, which amounted not to singing, and yet was different from speech, should be dated. After this successful experiment, Rinuccini wrote *Euridice* and *Arianna*, two other dramas for the same kind of music.

The revival of theatrical music was brought about by the invention of recitative, which is now universally received, practised, and preferred to the madrigal style, in which the words are so utterly unintelligible.

Peri, in his preface, after enumerating the great personages who were present at the representation of the musical drama of *Euridice* at Florence in 1600, and the eminent musicians to whom his music had been shewn, tells us, that it was sung by the most excellent performers of the time; among whom were signor Francesco Rasi, a nobleman of Arezzo, who represented the part of Aminto; signor Brandi, Arcetro; and signor Melchior Palantrotto, Pluto. He then tells us, that "behind the scenes, signor Jacopo Corfi played the harpsichord; Don Garzia Montalvo the chitarone, or large guitar; Messer Giovambatista dal Violino the lira grande, or viol da gamba; and Messer Giovanni Lapi a large lute."

These four seem to have composed the whole band. For though he celebrates the performance of Giovambatista Jacomelli on the violin, neither he, nor any one else, played on that instrument at the exhibition. He concludes his account of this drama by owning that some parts of it were composed by Giulio Caccini, detto Romano, "whose great merit was known to the whole world," because it was to be sung by persons dependent on him; by which he probably means to say, that they were his scholars. He boasts of having *opened the road* for others, by his essays at dramatic music.

Monteverde set Rinuccini's *Arianna* for the court of Mantua, in 1606; the words only were then printed, and reprinted several times after. This opera was performed at Venice, 1640, to Monteverde's composition, and the words again reprinted; but whether the music was ever published, we know not.

In a discourse by Pietro della Valle on the music of his own time, addressed by that celebrated traveller to Lelio Guidiccione in 1640, and published in the second volume of the works of Battista Doni, at Florence, 1763, there is an interesting, clear, and admirable account of the state of music in Italy, but particularly at Rome, during the beginning of the 17th century.

This agreeable writer, who had studied music under the best masters from seven years old, and who seems to have been an excellent judge of the subject, having differed in opinion from his correspondent, who, in conversation, had asserted that music for 50 years back had been declining, and that there were no professors left equal to those of former times; La Valle endeavouring to prove, on the contrary, that, so far from having degenerated, it was in a state much nearer perfection at the time he wrote, than at any former period.

If canons, fugues, inversions, and all the artifices of elaborate and learned compositions are less practised in vocal music now, says the author, than formerly, it is because they are so unfavourable to poetry, and the intelligence of what is sung; for in fugues of many voices, there are as many different words as notes sung at the same time, which occasions such confusion, that it is utterly impossible to discover the sentiment of the poet; which is the soul of the song, and that which chiefly makes a voice superior to an instrument. If the words and the notes do not mutually help to explain and enforce each other, they are ill-matched, and unfit to be together. To the confusion arising from all the parts singing different words at the same time, may be added the little attention to accent in fugues, where the ligatures and other accidents in harmony frequently throw the emphasis on wrong words, and make long syllables short, and short long. Another inconvenience, or rather absurdity, seems inevitable in vocal fugues of much subtilty and contrivance, where quick and slow, chearful and pathetic notes, are moving at the same time, which makes good performers unwilling to sing them, as they can neither manifest taste, nor sense, in the execution.

The old masters certainly were well acquainted with harmony, but few knew what use to make of it. Their compositions are full of the most artful and difficult inventions and contrivances, which the ear can neither taste nor comprehend in the performance.

This is not the method by which modern masters proceed: they have learned how to choose and respect good poetry, in setting which they relinquish all the pedantry of canons, fugues, and other Gothic inventions; and, in imitation of the ancient Greeks, aspire at nothing but expression, grace, and propriety.

The first good compositions that have been heard of this kind, in modern times, were *Dafne*, *Euridice*, and *Arianna*, written by Rinuccini, and set by Jacopo Peri and Monteverde.

In speaking of the madrigalists of his own time, Valle says, though they had improved and polished that species of composition far beyond those of the preceding age, yet they grew every day in less request than formerly; as the singing single songs with taste and expression, accompanied by an instrument, was now preferred to four or five people poring over their books at a table, which seemed too studious and scholastic for the entertainment of a company.

In the first operas, music was the principal object, with mythological characters in the fable. Machinery next took the lead, with perspective and decoration; when it was impossible to tire an audience at a greater expence.

It was near 50 years before regular airs had admission in these early musical dramas. At first they were generally accompanied by the singer himself on the violin, harp, or violoncello; but during the mythological passion, and rage for machinery, the only wish of the impresario was to dazzle the eyes, and stun the ears of the audience.

Gods and devils, heroes and heroines, and at length men and women, as history represents them, were brought on

the stage. These several reforms and changes of taste in the public led at length to *Apostolo Zeno* and *Metafasio*; when the exquisite airs of *Leo*, *Vinci*, and *Pergolesi*, with the great vocal talents of a *Pistocchi*, *Nicolini*, *Farinelli*, the *Faustina*, and *Cuzzoni*, exalted the lyric stage to its highest degree of public favour.

Rousseau's reflections on the language most proper for music are all levelled at the French, and at their nasal, equivocal, and mute syllables. He has an excellent period on the imitations of painting and music: "Music imitates the sentiments, painting the image of man."

Imitations in painting are always cold, from the want of that succession of ideas, and those impressions which heat and inflame the soul by degrees; whereas in painting, every thing is said at the first glance. The imitative power of this art, with many apparent objects, is confined to very feeble representations. It is one of the great advantages of a musician, that he is able to paint things which cannot be heard, while it is impossible for the painter to delineate what cannot be seen; and the greatest prodigy of an art, which has no other activity than its movements, is to be able to paint the image of repose, of sleep, a calm night, solitude, and even silence, among musical pictures. Sometimes noise produces the effect of silence, and silence the effect of noise: as when a man sleeps at an equal and monotonous reading, and wakes the instant it stops; and it is the same for other effects. But the art has substitutions more fertile and more subtle than these. It can excite by one sense similar emotions to those that can be excited by another: and as the relation can only be sensible by a strong impression, painting, in want of such force, returns with difficulty to music those imitations which she has drawn from her. Let all nature sleep, he who contemplates the fight is not asleep; and the musician's art consists in substituting, to the insensible image of the object, that of the movements which its presence excites in the mind of the spectator. He does not represent the immediate object, but awakens in our minds the same sentiment which we experience in seeing it. Rousseau goes deep into dancing. See *BALLET*.

Operas in general are not to be read or spoken, but to be sung; and "nonsense well tuned" has at all times been heard with pleasure. But there is agreeable nonsense, and there are pleasing trifles. Music can please without words, as well as poetry without music: each has its votaries and distinct powers of affording delight. The union of both is certainly best; as the words, if they could be understood, might not only please but convey instruction. But there is a jealousy between the two sisters, Music and Poetry, which prevents them not only from being kind relations, but good neighbours. Yet does not Poetry frequently beg assistance from Music to embellish both her tragedies and comedies with incidental songs, symphonies, choruses, soft music, marches, act tunes, &c. even in her regular dramas that are declaimed, such as *Macbeth*, the *Tempest*, *Fair Penitent*, &c. without Music thinking herself degraded by acting a subordinate part? And might not Music ask the aid of her sister Poetry, to furnish her with impassioned words, as vehicles for her strains as principal? If this were done reciprocally and cordially, with a sincere wish to assist and exalt each other by turns, without envying and grudging every mark of approbation that is bestowed on her rival, and regarding it as a robbery from herself, each might severally display her peculiar powers of charming and instructing by turns, without injury or degradation.

A lyrical drama is incomplete without music, which is not the case with a play written for declamation: yet people are dissatisfied if an opera does not read in the closet as well

as a tragedy or comedy. Unreasonable critics want to unite two things totally incompatible, strength and energy with melodious softness. They want black and white to harmonize, without tinging or deforming each other.

Verbes full of philosophy and ethics, strong reasoning, bold metaphors, or epigrammatic wit, must be enfeebled by music, which conveys them slowly to the mind; though passion, sentiment, graceful and pleasing images and descriptions, are embellished by it. Degrading poetry to elevate music, would be acting in a hostile manner to our own pleasures. Let poetry be regarded as an intellectual pleasure, if you please; and music be ranked, like painting, as an innocent gratification of sense. There surely can be no more harm in listening with rapture to fine music well executed, than in regarding with delight and wonder a cartoon of Raphael, or a holy family of Correggio. Sublime poetry leaves the musician nothing to do.

No people write about music more agreeably, or with reasoning more specious, than the French; and for themselves, and their own powers of execution, it is more than specious: for, singing out of the question, it is oracular. In France, where the art of singing is unknown, at least by their public fingers, their dramas should be calculated for declamation, by which they would be rendered more interesting, and more impressive, than where singing is the principal talent to be displayed.

But when great fingers are employed at an enormous expence, who have voices highly cultivated, and are possessed of uncommon powers of embellishing sound, and of rendering music something more than *vox pretereaque nihil*, why should they be denied the opportunity of displaying their abilities, and the lovers and judges of music of receiving delight from their exertions? There is nothing immoral in sound, if it is even connected with vice or immorality: it is by keeping bad company, and embellishing the ribaldry and nonsense of another art;—it is needless to say that *poetry* is in fault.

OPERA *Buffa*, or *Burletta*, in *Italian Music*. It was the opinion of Muratori (*Della Perf. Poef.*), that a musical drama or farce, called "L'Anfiparnaso," written and set by the celebrated Orazio Vecchi, and acted and printed at Venice, 1597, was the origin of the *opera buffa*, or comic opera, in Italy; and that learned antiquary seems implicitly to have founded his opinion upon the author's own words; who, in the preface, says, that his performance is an "accoppiamento di comedia e di musica, non più stato fatto, ch'io mi sappia, da altri, e forse non imaginato: A union of comedy and music, never attempted, to his knowledge, nor perhaps ever thought of before." The several Italian states being under different governments, and having but little communication with each other, may account for Orazio Vecchi's ignorance of any attempt at a musical drama before; but Muratori, in later times, should have known what every stranger is able to learn from the general register of dramas of every kind in the "Drammaturgia di Lioni Allacci," that besides the *Sacrificio* of Beccari, set to music by Alfonso Viola, at Ferrara, in 1555, there are innumerable musical dramas upon record of a higher date than L'Anfiparnaso of Orazio Vecchi: as *I Pazzi Amanti*, rappresentata in musica in Venezia, 1569; *La Poesia Rappresentativa*, componimento per Musica, Ven. 1574; *La Tragedia*, componimento, poesia di Frangipani, musica di Claudio Merula, Ven. 1574; *La Poesia Rappresentata*, componimento musicale cantato in Venezia, l'anno 1578; *Il Re Salamone*, rappresentatione musicale, cantata in Ven. 1579; *Pace, e Vittoria*, rappresentazioni cantata in musica, in Ven. 1580; *Pallade*, componimento per musica, in Ve-

nezia, 1581, and *Il Fiore*, rappresentazione cantata in musica, Ven. 1582, &c. most of which were probably sung to the same kind of music as Vecchi's *Comedia Armonica*; but to none of them can the title of opera be accurately given, as they all preceded the invention of narrative melody, or recitative, which, in our opinion, can only constitute an opera serious or comic.

The music of this piece is printed in a score of five separate parts, which are all employed throughout, even in the prologue, which in modern times is usually a monologue. So that each scene is nothing more than a five-part madrigal in action: for though the whole is in measure, and in five parts, yet all the characters never appear on the stage together, except in the finale, or last scene. There are excellent wooden cuts at the beginning of every scene, by which the number of persons employed in it, and their principal business appear.

This drama is neither mentioned by Crescimbeni, nor in the *Drammaturgia*; and though Walther gives a list of twelve works, which Orazio Vecchi printed between the years 1580 and 1613, the *Anfiparnaso* is not included. Nor is it enumerated among this author's works by his scholar, our countryman, Peacham. Vecchi ranked very high among the composers of his time; and, according to Santarelli, was the first who used the B *quattro* or \sharp , not merely to express the found B natural in the diatonic scale, to which it had till then been wholly confined; but as a moveable character, applicable to any other found that had been altered by a flat or a sharp, which it has the power of restoring to its original pitch in the scale.

In the wooden cut preceding the prologue, and several scenes of the piece, as only one figure is represented, though the music is in five parts, the other four must have been sung behind the scenes.

And as there is nothing like a solo air, or recitative, in the whole performance, it appears that the drama had not yet got out of the trammels of fugue, imitation, and perpetual chorus; and that so much of the church style was still preserved as to render modulation equivocal, and the keys difficult to determine by any rules in present use. The time, too, is as unmarked and doubtful as the modulation; and what little melody there is, by being divided among so many parts in dissimilar motion, loses its effect, and must have rendered the words unintelligible even to the natives of Italy.

As there is no overture to this or any of the first musical dramas, we may suppose that the prologue supplied its place. Indeed, no part for an instrument of any kind is printed throughout the piece; consequently, as there was no orchestra, there could be no symphonies or ritornels to the songs, or rather choruses, of each scene.

Every movement throughout this drama begins in common time, and very seldom changes into triple measure. There are no bars, or flats and sharps at the clef. But though it is very seldom that any other sign than that for

common time appears, as C, or C \sharp ; yet we are con-

vinced that the measures must frequently have been changed, by agreement, in the performance, to make melody of some passages practicable; which, though extremely difficult and unmeaning in common time, become easy, pleasing, and expressive in triple. And it is not perhaps so much from the change of style and general cast of the melody, that we have lost the expression of old music, as from our ignorance of the time, not only of the movements, but of the notes themselves, to which great latitude must frequently have been given

given in the performance; though the composers had not discovered the art of expressing this latitude by the different characters or technical terms, which have since become general.

Vecchi lived in an age when an opportunity for fugue and imitation was irresistible. In scenes of dialogue, such contrivances might have been turned to account; but there is little diversity of style or movement from the beginning to the end of the piece. The language is in general *Modense*, and not intelligible even to many Italians.

In comparing Vecchi's music in five parts with that of Emilio del Cavaliere, Jacopo Peri, Giulio Caccini, and Claudio Monteverde, the legislators of dramatic music, it appears that Muratori has been guilty of two mistakes in his account of Orazio Vecchi's musical comedy: first, in supposing it to have been the earliest of the kind that was wholly sung from the beginning to the end, without any mixture of declamation, as instances have been produced of eight anterior pieces of the same kind; secondly, in imagining that Rinuccini took this drama for a model, as the dramas which Emilio del Cavaliere set for Florence, so early as the year 1597, offered him an example of a species of music much more dramatic than the madrigal style of Vecchi, which was precisely that which Rinuccini and his learned Florentine friend wished to avoid.

When and where the first opera buffa was performed, *in stilo recitativo*, we have not been able to ascertain. There was a mixture of comic characters in almost all the musical dramas of the last century: however, in 1641, soon after the introduction of serious operas upon the Venetian stage, we find the comic opera of *La Finta pazza*, written by Claudio Strozzi, and set by Saccati, and *La Ninfavara*, written and set to music by Benedetto Ferrari, in the list of the musical dramas of that year. And among those performed at Rome and Bologna, about the same time, though the music is not easy to find, the words have been preserved in many collections of poems. The famous opera of *Orontea*, first set by Cesti in 1649, as mentioned elsewhere, was a tragi-comedy; as was the opera of *Erismena*, set by Cavalli in 1655, of which also an ample account, with specimens of the music, have been given. But at this time, air, which was scarcely separated from recitative, had not two distinct characters, as at present, for serious and comic purposes; for the subjects of comic operas, during the last century, were seldom so farcical as those of modern burlettas, and therefore were less likely to suggest such gay, grotesque, and frolicsome measures. Tragi-comedies in music had a very early admission on the stage at Bologna, during the last century: as *Andromeda Tragicomedia*, set by Girolamo Giacobbi, maestro di capella of S. Petronio, and founder of the academy de' Filomusi in that city, was performed in 1610, and *Amore vuol gioventu*, *Scherzo drammatico*, at Viterbo, 1659; *Musica di Giambattista Mariani*, 1659. But the only real burlettas, which we have met with, are *Girello*, *Dramma burlesca*, set by Pistocchi, 1672, which was represented at Venice by little figures of wax; *I dui Diogeni*, *Dramma burlesca per Musica*, and *Agrippina in Baja*, *Scherzo Drammatico per musica*, were both performed at Ferrara, 1687. Indeed, we learn but little of the burletta music of Italy, till the comic operas of Latilla, Ciampi, and Galuppi, were performed on our stage, of which we shall have occasion to speak elsewhere.

OPERA-Glass, in *Optics*, is so called from its use in play-houses, and sometimes a *diagonal perspective*, from its construction, which is as follows. *A B C D* (Plate XVI. *Optics*, fig. 21.) represents a wooden tube about four inches long; in each side of which there is a hole *E F* and *G H*, exactly

against the middle of *I K*, a plane mirror, which reflects the rays falling upon it to the convex glass *L M*, through which they are refracted to the concave eye-glass *N O*; whence they emerge parallel to the eye at the hole *r s*, in the end of the tube. Let *P a Q* be an object to be viewed, from which proceed the rays *P c*, *a b*, and *Q d*: these rays, being reflected by the plane mirror *I K*, will shew the object in the direction *c p*, *b a*, *d q*, in the image *p q*, equal to the object *P Q*, and as far behind the mirror as the object is before it; the mirror being placed so as to make an angle of 45 degrees with the sides of the tube. And as in viewing near objects it is not necessary to magnify them, the focal distances of both the glasses may be nearly equal; or if that of *L M* be three inches, and that of *N O* one inch, the distance between them will be but two inches, and the object will be magnified three times, which is sufficient for the purposes to which this glass is applied.

If the object be very near, as *X Y*, it is viewed through a hole *x y*, at the other end of the tube *A B*, without an eye-glass; the upper part of the mirror being polished for that purpose, as well as the under. The tube unscrews near the object-glass *L M*, for taking out and cleaning the glasses and mirrors. The peculiar artifice of this glass is to view a person at a small distance, so that no one shall know who is observed; for the instrument points to a different object from that which is viewed, and as there is a hole on each side, it is impossible to know on which hand the object is situated which you are viewing. The position of the object will be erect through the concave eye-glass. The common opera-glass is nothing more than a short Galilean telescope; which see. See also *POLEMSCOPE*.

OPERATION, in the general, the act of exerting, or exercising some power, or faculty, upon which an effect follows.

The noblest operation of man is that by the schoolmen called *vital*, or *immanent*; viz. the operation of the mind; which, with regard to the understanding, is threefold; apprehension or perception, discretion or judgment, and reasoning or discourse.

The direction of these makes the object of logic.

With regard to the will, the immanent operations are willing and nilling: to which are referred loving and hating.

OPERATION, in *Medicine*, denotes a methodical action of the hand on the human body; in order to re-establish health.

Bleeding is a very common, but, at the same time, a dangerous operation.

Trepanning is one of the finest operations in surgery.

The Cæsarean operation is the cutting open of a woman with child, and drawing out the child through the aperture.

The other chirurgical operations are futures, tapping, castrating, cutting for the fistula, amputation, extirpation, cupping, &c. See *SUTURE*, &c.

OPERATION, *High*. See *HIGH* and *LITHOTOMY*.

OPERATION, *Lateral*. See *LITHOTOMY*.

OPERATION is more particularly used, in *Medicine*, for the means by which any remedy produces its salutary effect; or that series of actions, mediate and immediate, by which its remote end is attained.

See the operations of each kind of medicines under the proper heads, *SPECIFICS*, *PURGATIVE*, *EMETICS*, *OPiates*, &c.

OPERATION, in *Chemistry*, denotes the processes, or experiments, by means of which the proper changes are produced in bodies, and the effect of the art procured.

The changes chemistry produces in bodies, are reducible to

to two kinds; viz. an union of parts, and a separation of them: thus chemistry either separates spirits, salts, oils, &c. or compounds them together.

A chemical operation, then, consists in changing the situation of the parts; particularly, either in moving some parts, but not the whole, which is called *separating*; or, in adding new parts, which is called *uniting*.

All chemical operations, therefore, are reducible to two general kinds: viz. such whereby the parts of bodies, before joined or united, are separated, which the ancient chemists called *solution*; and such whereby the parts, before disjoined, are combined or united, called *coagulation*.

Some, however, object digestion as a third species of operation, not reducible to either of them; but Boerhaave shews, that it is a composition of both.

Most chemists, however, look on this division as scarcely accurate and minute enough, and subdivide the art into a number of particular or subordinate operations; as calcination, vitrification, distillation, sublimation, cohobation, amalgamation, fermentation, putrefaction, &c.

OPERATION, in *Theology*, is used for the actions, both of the Word and the man, in Jesus Christ. See PERSON.

The orthodox teach, that there are two operations in Jesus Christ, the one divine, the other human; and not one *theandric* operation, as was the doctrine of the Monothelites and Monophysites.

OPERATOR, in *Surgery*, &c. a person who operates, or works with the hand, on the human body, to preserve or restore its health.

We say an *operator for the stone*, meaning a lithotomist, or a person who cuts.

OPERATOR *for the Eyes*, denotes a person who cures cataracts, &c.

OPERATOR *for the Teeth*, signifies a tooth-drawer, &c. See TEETH.

OPERBANDA, in *Geography*, a town of Bengal; 25 miles N.W. of Nagore.

OPERCULARIA, in *Botany*, a genus of Gærtner's, whose name is derived from *operculum*, a lid, because the seeds are fixed to the bottom of the lid or covering of the receptacle.—Gærtner. t. 24. Schreb. 65. app. 819. Willd. Sp. Pl. v. 1. 563. Mart. Mill. Dict. v. 3. Ait. Hort. Kew. ed. 2. v. 1. 232. Lamarck Dict. v. 4. 560. Illustr. t. 58. (Pomax and Rubioides; Soland. MSS.)—Class and order. *Tetrandria Monogynia*. Nat. Ord. *Rubiaceæ*, Juss.?

Gen. Ch. *Cal.* Common perianth of one leaf, bell-shaped, permanent, containing three or six flowers, with fix or nine acute, unequal teeth; proper perianth none. *Cor.* universal equal; proper of one petal, funnel-shaped, with a four or five-toothed, erect mouth. *Stam.* Filaments four, inserted into the receptacle; anthers distinct. *Pist.* Germen inferior, immersed in the receptacle; style thread-shaped; stigma thickish, cloven. *Peric.* none. *Seeds* solitary, convex on one side, furrowed on the other. *Recept.* common deciduous, flat above, closing the aperture of the calyx below the teeth; pyramidal below, furrowed and angular; the angles continued into partitions, by which the cavity of the calyx is divided into as many cells as there are seeds.

Ess. Ch. Common calyx bell-shaped, fix or nine-toothed, with three or six flowers. Partial calyx none. Partial corollas four or five-cleft, equal. Seeds solitary, immersed in the receptacle.

1. *O. umbellata*. Willd. n. 1. Gærtner. t. 24. (Pomax umbellata; Soland. MSS.)—Flowers umbellated, monandrous.—Native of New Holland. *Stem* round, hairy, with opposite branches. *Leaves* opposite, stalked, oblong, hairy

on both sides. *Flowers* terminal, umbellated. This species is remarkable for having three separate, three-toothed flowers in the disk; a single stamen; and occasionally two styles.

2. *O. aspera*. Willd. n. 2. Gærtner. t. 24. Juss. Annales de Mus. v. 4. 427. t. 70. f. 1. (Rubioides aspera; Soland. MSS.)—Flowers capitate. Calyx furrowed, smooth. Native of New South Wales. Introduced at Kew in 1790, by Sir Joseph Banks, where it flowers in June and July.—*Stems* upright, forked, round, furrowed, smooth. *Leaves* opposite, ovato-lanceolate, entire, smooth, veined. *Flowers* capitate, terminal, drooping.

3. *O. paleata*. Young in Linn. Soc. Transf. v. 3. 30. t. 5. Ait. Hort. Kew. ed. 2. v. 1. 232.—Receptacle globular, chaffy.—Native also of New South Wales. It flowers at Kew in July and August. This new species of *Opercularia* may possibly be a distinct genus; at least such a suspicion is started by Dr. Young, who originally described it, and should that opinion be established, he proposes to call it *Cryptospermum*. *Root* perennial, fibrous. *Stem* herbaceous, erect, three or four feet high, slightly quadrangular, smooth, rather striated, branched. *Leaves* opposite, spreading, sessile, acute, sometimes pointed, green. *Stipulas* lateral, awl-shaped, greenish. *Flowers* aggregated, terminal, on longish stalks, which at first are erect, then drooping, and afterwards become erect again. The whole herb has rather a nauseous smell, resembling decaying pot-herbs.

4. *O. diphylla*. Willd. n. 3. (Rubioides diphylla; Soland. MSS.)—Flowers capitate. Calyx hispid.—Native of New Zealand. Very similar to the two first species in habit. Its head of flowers about half the size of that of *O. aspera*.

OPERCULUM, a lid, is exclusively used for the finally deciduous covering of the capsules of Mosses, see MUSCI; which is firmly united to their rim, concealing the ring and fringes, till the seeds are ripe. It is itself concealed by the *calyptra* or veil, whose point is, in a growing state, firmly united with the summit or centre of the lid, both together performing, as it appears, the office of a stigma. The lid is always more or less convex, sometimes hemispherical, with a central boss, or *umbo*, but more frequently conical or awl-shaped, and then either straight or curved. The surface is always smooth; the colour commonly a little different from that of the capsule. The lid is frequently as long as its capsule, but hardly ever longer. The differences in its shape afford excellent specific distinctions, but not generic ones.

OPERCULUM, in the *History of Shell-fish*, denotes the cartilaginous cover with which nature has furnished the mouths of the univalve water-shells; for as to the land ones, they have only a viscid liquor to supply the place of an operculum.

OPETOPEC, or MUMBACHO, in *Geography*, a small but beautiful and fertile island of Mexico, with a town of the same name, in the S. part of lake Nicaragua.

OPFFERSHAUSEN, a town of Germany, in the county of Henneberg; 7 miles N.W. of Meinungen.

OPHEIM, a town of Norway, in the province of Bergen; 45 miles N.E. of Bergen.

OPHERA, or OPIER, in *Scripture Geography*, a town of Judea, in the tribe of Benjamin. Josh. xviii. 20.

OPHIASIS. See ALOPECIA.

OPHICARDELON, in *Natural History*, the name of a gem mentioned by Pliny, which, he says, was a black stone covered at top and bottom with white: this seems, without doubt, to have been the *camea* of our jewellers.

OPHICEPHALUS, in *Ichthyology*, a genus of fishes of

of the order Thoracici; the head is coated with dissimilar scales; body elongated. There are two species described by Dr. Shaw.

Species.

PUNCTATUS. Pale beneath, with the head pierced by pores, and the body speckled with black points. It is about ten inches long; the dorsal fin commencing at no great distance from the head, and continued nearly to the tail; it is of a moderate breadth, and of a dusky colour spotted with black; the anal fin is of a similar shape and colour; the tail is rounded; the pectoral fins rounded, and of a moderate size; the ventral are smaller; the scales are rather large; those on the head are dissimilar; *viz.* on the upper part angular, as in snakes; on the sides ovate or rounded; the lateral line nearly straight. It is a native of India, inhabiting rivers and lakes, and is considered as a delicate and wholesome food.

STRIATUS. The abdomen and fins striated with dusky and whitish variegations. It is about twelve inches long. It is a native of India, inhabiting lakes, where it is frequently found much larger than the size just mentioned; it is in equal esteem as a food with the former species, and has been recommended as a proper diet for convalescents.

OPHIDIUM, a genus of fishes of the order Apodes; the generic character is head nakedish; teeth both in the jaws and palate; gill-membrane seven-rayed; body ensiform. There are four

Species.

* **BARBATUM**; Bearded Ophidium. Lower jaw with four cirri. It inhabits the Mediterranean and Adriatic seas, and is rarely found in the British; it is from twelve to fourteen inches long; is of a silvery-grey colour with linear spots; lateral line dusky. The head of this species is small, without scales; the upper jaw is doubled in and longer than the lower; the lips are thick; the teeth are very small; the eyes are covered with a common skin, the pupil is black, the iris is golden, with a transparent nictitant membrane; the tongue is smooth, narrow and short; the back is convex and blueish; the lateral line is brown; the vent is nearer the head than the tail; pectoral fins small, brown at the base and edged with cinereous, the rest joined together, narrow, white and edged with black; the scales are irregularly placed and dispersed over the body; they are sometimes round, sometimes nearly oval, larger near the head, and hardly distinguishable near the tail, adhering to the body by means of a thin transparent skin. It is often taken by nets in Provence and Languedoc, and is most common during the summer season. It feeds on smaller fishes and crabs.

IMBERBE; Beardless Ophidium. Jaws without cirri; tail somewhat blunt. It inhabits European seas, particularly the Mediterranean. The dorsal, anal, and caudal fins are united.

VRIDE; Green Ophidium. Jaws without cirri; the tail is a little pointed. It inhabits the deep parts of the Greenland seas; is a very rare fish, and is often found as large as a whiting; the body is long, compressed, green; flesh eatable.

ACULEATUM; Prickly Ophidium. The generic character is, jaws acuminate. It is described by Dr. Shaw under the name of *O. rostratum*, or ophidium with an extremely long sharp-pointed snout. This is readily distinguishable from another described by the same author, called the *O. mastacembalus*, by the very great elongation of the upper lip, which terminates in a sharp, slender snout. The colour of this fish is rufous brown above, silvery on the sides and be-

neath; the dorsal fin is variegated with oblique dusky streaks, and is marked with from two to five round, black spots, each surrounded by a pale yellowish circle.

MASTACEMBALUS; Ophidium with sharpish-pointed equal jaws. This, according to Dr. Shaw, was first described by Dr. Russel in his Natural History of Aleppo. It has so much the general appearance of an eel, that it is often taken as such by Europeans resident at Aleppo, and eaten by them for that fish. Its usual length is from a foot to eighteen inches long; the eyes are small, situated on each side at no great distance from the tip of the snout; the nostrils are seated at some distance before the eyes; the whole body is covered with small scales, like those of an eel; the colour on the upper parts is a clouded variegation of whitish and rufous, the under parts being entirely white; it is principally taken in the river Kowick near Aleppo.

OPHIOBORUS, in *Natural History*, a name given by the ancients to a species of carnivorous fly, which feeds on the bodies of beetles, or other flies, or on the flesh of dead serpents. Its wings are of the colour of polished brass, whence it was also called by the Greeks *chalconia*, the brass-fly.

OPHIOGLOSSUM, in *Botany*, from *οφις*, a serpent, and *γλωσσα*, a tongue, an ancient name, admirably adapted to the cryptogamic plant, for which Linnæus and all other writers have retained it. Adder's Tongue. Linn. Gen. 559. Schreb. 756. Willd. Sp. Pl. v. 5. 58. Mart. Mill. Dict. v. 3. Sm. Fl. Brit. 1106. Ait. Hort. Kew. ed. 1. v. 3. 455. Juss. 14. Lamarck Dict. v. 4. 561. Illustr. t. 814. Tourm. t. 325. Swartz Syn. Fil. 169. Brown Prod. Nov. Holl. v. 1. 163.—Class and order, *Cryptogamia Filices*. Nat. Ord. *Filices Spicate*.

Eff. Ch. Capsules naked, united into a jointed two-ranked spike, each of one cell and two valves, bursting transversely.

Obf. From this genus are now, with the greatest propriety, separated several Linnæan species, which have a scale-like involucre to each capsule, as well as a spurious ring. These constitute the *Lygodium* of Swartz, *Ugena* of Cavanilles, and *Hydroglossum* of Willdenow. The *Ophioglossum scandens* and *flexuosum* of Linnæus and other authors, beautiful climbing ferns, totally unlike in habit to every genuine *Ophioglossum*, are among them.

1. *O. vulgatum*. Common Adder's-Tongue. Linn. Sp. Pl. 1518. Engl. Bot. t. 108. Bolt. Fil. t. 3. Fl. Dan. t. 147. Hedw. Theor. 44. t. 4. f. 20—23. (Ophioglossum; Fuchf. Hist. 577. Math. Valgr. 543. Camer. Epit. 364. Ger. em. 404.)—Spike from the stem. Leaf ovate, obtuse, closely reticulated.—Native of moist meadows and pastures in Europe and North America, producing its spike in May. Root perennial, of a few thick simple fibres. *Herb* not a span high, green and smooth in every part, consisting of a simple round erect stem, bearing one ovate leaf, an inch and half long, which, as Willdenow justly observes, is reticulated with close, not very obvious, veins. The stem is terminated by the lanceolate, narrow, compressed spike, which consists of numerous capsules, full of minute chaffy seeds, and is sometimes divided. The nature of the flowers, or impregnation, is perhaps as absolutely in the dark as in any other known plant.

2. *O. ovatum*. Sw. n. 2. (*O. simplex*; Rumph. Amb. v. 6. 152. t. 68. f. 2.)—Spike from the stem. Leaf ovate, acute, coarsely reticulated.—Native of the isle of Bourbon, near the Volcano; also of shady moist grassy pastures in Amboina, &c. Much like the last, with which most people have confounded it, but the above characters may perhaps be

sufficient to distinguish them. The point of the *leaf* however varies in acuteness.

3. *O. nudicaule*. Linn. Suppl. 443. Swartz Syn. 397. t. 4. f. 2. (*O. lusitanicum*; Thunb. Prodr. 171.)—Spike radical. Leaf ovate, obtuse, somewhat stalked.—Gathered by Thunberg at the Cape of Good Hope. About half the size of the two preceding, with a narrower *leaf*, whose *stalk* is scarcely connected with that of the *spike*.

4. *O. lusitanicum*. Linn. Sp. Pl. 1518. Lamarck Illustr. t. 864. f. 3. (*O. angustifolium minimum*; Barr. Ic. t. 252. f. 2.)—Spike from the stem. Leaf lanceolate.—Native of Portugal, Italy, &c. Size of the last, but differing essentially in the above characters. The *root* creeps, throwing up, here and there, a cluster of *fronds*.

5. *O. gramineum*. Willd. in Act. Erford. for 1802. 18. t. 1. f. 1.—Spike from the stem. Leaf linear-lanceolate, acute, ribless.—Gathered by Koenig, in stony pastures on the coast of Malabar, in New Holland, by Sir Jos. Banks. More diminutive than any of the foregoing, being only two inches high, and very slender. The *spike* is scarcely surmounted by any point, or barren termination, which most of the former have.

6. *O. costatum*. Brown n. 2.—Spike from the stem. Leaf lanceolate-oblong, single-ribbed, reticulated with veins.—Gathered by Mr. Brown at Port Jackson, as well as in the tropical part of New Holland. We know it from his publication only.

7. *O. bulbosum*. Michaux Boreali-Amer. v. 2. 276. (*O. crotalophoroides*; Watt. Carol. 256?)—Spike from the stem. Leaf ovate, somewhat heart-shaped, obtuse. Root bulbous.—Native of sandy ground in South Carolina. Rather larger than *O. lusitanicum*; remarkable for its globose bulbous *root*. The *spike* is pointed.

8. *O. reticulatum*. Linn. Sp. Pl. 1518. Lamarck Illustr. t. 864. f. 2. (*O. cordatum et reticulatum*; Plum. Fil. 141. t. 164.)—Native of the East and West Indies, not uncommon. This is larger than the *vulgatum*, and readily known by its broad heart-shaped, wavy *leaf*, strongly reticulated with numerous veins.

9. *O. pendulum*. Linn. Sp. Pl. 1518. (Scolopendria major; Rumph. Amboin. v. 6. 84. t. 37. f. 3.)—Spike stalked, from near the middle of the long linear frond.—Native of woods in Amboina and the island of Mauritius, hanging from the branches of old trees. It was also found by the late Mr. David Nelson, on the lofty mountains of Owhyhee, as appears by fine specimens in the Banksian herbarium. The *roots* consist of long smooth fibres, like those of an *Epidendrum* or *Dendrobium*. *Fronds* several, pendulous, twelve or eighteen inches long, linear, strap-like, smooth, entire, tapering at each end, rarely cloven. *Spike* nearer the base than the extremity of the centre of each frond, solitary, stalked, two or three inches long, composed of very numerous crowded *capsules*, and generally tipped with a small point.

10. *O. palmatum*. Linn. Sp. Pl. 1518. Plum. Fil. 139. t. 163.—Spikes several, lateral, stalked, from the wedge-shaped base of the palmate frond.—Native of Hispaniola, where it was found, in one spot only, by Plumier. We have specimens from more recent French travellers. This is the largest known species of its genus. The fibres of the *root* are divided. *Fronds* erect, smooth, two feet high, each with a round *stalk*, a little hairy at its base; the *leaf* wedge-shaped at the lower part, where, from its edges, spring on each side three or four stalked drooping *spikes*, like those of *O. pendulum*, except in being marginal. The upper part is deeply palmate, scarcely ribbed or veined, wavy, but entire.

OPHIOMANCY, *Οφιομαντεία*, compounded of *οφίς*, a serpent, and *μαντεία*, divination, in *Antiquity*, the art of making predictions from serpents. Thus Calchas, on seeing a serpent devour eight sparrows with their dam, foretold the duration of the siege of Troy. And the seven quails of a serpent that was seen on Anchises's tomb, were interpreted to mean the seven years that Æneas wandered from place to place before he arrived in Latium. Thus, Virgil, *Æn. lib. v. ver. 85*.

“Septem enim gyros, septena volumina traxit.”

OPHIOMORPHITES, in *Natural History*, the name given by some authors to the fossils called more usually cornu ammonis; which are composed of several wreaths, rolled in a spiral form over one another, and resembling a snake when rolled up. These are found of prodigious sizes, some not less than the fore-wheel of a chariot. They are evidently formed from some sea-shell, the shelly matter remaining on some of them, and all being composed of several cells, communicating with one another by means of a siphunculus, in the manner of those of the nautilus.

OPHIOPHAGI, a name given by some to the eagle, vulture, and some other birds of prey which are sometimes seen to feed on serpents.

Pliny gives the name ophiophagi to a certain people of Æthiopia, whom he describes as very barbarous and savage, going always naked, and feeding on serpents, whence the appellation. Solinus, who generally copies Pliny but imperfectly, has perverted his meaning strangely in this passage, having placed the ophiophagi in Arabia Felix, instead of Æthiopia.

OPHIORRHIZA, in *Botany*, a Linnæan genus, whose name is derived from *οφίς*, a serpent, and *ρίζα*, a root, because the plant, says Hermann, is regarded in Ceylon as a grand specific for the bite of the Nagha, or Ribbon Snake. This genus was originally called *Mitreola* by Linnæus, being the *Mitra* of Houston. (See MITREOLA.) Linn. Fl. Zeylan. 190, and 239. Gen. 85. Schreb. 111. Willd. Sp. Pl. v. 1. 826. Mart. Mill. Dict. v. 3. Michaux. Boreali-Amer. v. 1. 148. Juss. 143. Lamarck Dict. v. 4. 563. Illustr. t. 107. Gærtn. t. 55. Class and order, *Pentandria Monogynia*. Nat. Ord. *Stellatæ*, Linn. *Gentianeæ*, Juss.

Gen. Ch. *Cal.* inferior, of one leaf, erect, compressed, five-toothed, equal, permanent. *Cor.* of one petal, funnel-shaped, tube inflated at the base; throat almost closed with hairs; limb five-cleft, obtuse, spreading. *Stam.* Filaments five, thread-shaped, very short, inserted into the tube; anthers oblong, the length of the tube. *Pist.* Germen superior, cloven; style thread-shaped, as long as the stamens, thicker upwards; stigmas two, obtuse. *Peric.* Capsule broad, rather obtuse, divided into two, oblong, divaricated lobes, of two cells, bursting inwardly; the partition contrary. *Seeds* numerous, angulated, fixed round an oblong, stalked receptacle, loose in the middle of each cell.

Eff. Ch. Corolla funnel-shaped. Germen cloven. Stigmas two. Capsule two-lobed.

1. *O. Mungos*. Linn. Sp. Pl. 213. Mat. Med. 59. t. 1. Plenck. t. 90.—Leaves lanceolate-ovate.—Native of the East Indies. *Stem* simple. *Leaves* opposite, stalked, entire, smooth, with obliquely transverse nerves. *Flower-stalk* terminating the stem with a corymb of simple or cloven *spikes*, disposed in an umbellate manner from one centre, and spreading. *Flowers* sessile, from the upper side of the horizontal spike.

2. *O. Mitreola*. Linn. Sp. Pl. 213. Swartz. Obf. 59. t. 3. f. 2. (Mitreola; Hort. Cliff. 492.)—Leaves ovate.—Native

—Native of damp, grassy places, near the banks of rivers in Jamaica, flowering in the spring.—*Roots* from the lower joints of the stem, crowded, long, thread-shaped, white. *Stem* herbaceous, a foot high, simple or branched, erect, square below, roundish above, rather weak. *Leaves* opposite, stalked, pointed, smooth on both sides. *Flower-stalks* terminal, forked, lax. *Flowers* in spikes, sessile, all turned one way, separate, white; a solitary flower at the forked division of the flower-stalk.

In Swartz's figure above quoted, the engraver by mistake has substituted the wrong name for each of the plants delineated. Fig. 1. is *Macrocnemum jamaicense*, and fig. 2. is *Ophiorrhiza Mitræola*.

3. *O. subumbellata*. Willd. n. 3. Forst. Prodr. Fl. Austr. n. 66.—Stem shrubby. Leaves lanceolate, acute. Umbels axillary, three-cleft.—Native of Otaheite.—This species is only known from the above quoted authors.

OPHIOXYLUM, Serpentine Wood, derived from *ὄφις* and *ξύλον*, because its root spreads in a zigzag manner like the twisting of a serpent. Linn. Fl. Zeylan. 188. Gen. 539. Schreb. 725. Willd. Sp. Pl. v. 4. 979. Mart. Mill. Dict. v. 3. Ait. Hort. Kew. ed. 1. v. 3. 433. Juss. 149. Lamarck Dict. v. 4. 565. Illustr. t. 842. Gært. t. 109.—Class and order, *Polygamia Monœcia*, or rather *Pentandria Monogynia*. Nat. Ord. *Apocineæ*, Juss.

Gen. Ch. *Cal.* Perianth inferior, five-cleft, sometimes bifid, acute, erect, very small. *Cor.* of one petal, funnel-shaped; tube long, thread-shaped, thickened in the middle; limb five-cleft, spreading. Nectary uncertain, or only found in imperfect flowers, at the mouth of the corolla, cylindrical, entire. *Stam.* Filaments five, very short, in the middle of the tube, sometimes only two; anthers pointed. *Pist.* Germen superior, roundish; style thread-shaped, the length of the filaments; stigma capitate. *Peric.* Berry twin, two-celled. *Seeds* solitary, roundish.

Ess. Ch. Calyx five-cleft. Corolla five-cleft, funnel-shaped. Stamens five. Pistil one.

1. *O. serpentinum*. Three-leaved Ophioxylum. Linn. Sp. Pl. 1478. Jacq. Hort. Schoenbr. t. 389. Curt. Mag. t. 784. (*Ligultrum foliis ad singula internodia ternis*; Burman. Zeylan. 141. t. 64.)—Native of the East Indies. It was cultivated at Hampton Court in 1690, and flowers in May and June. *Stem* erect, round, quite simple. *Leaves* generally in fours, stalked, lanceolato-ovate, pointed, smooth. *Flowers* glomerate, terminal, white with a red tube; occasionally imperfect, when they have a nectary like that of *Narcissus*. *Berry* large and fleshy, two-lobed, of a brick red. Gærtner calls this species *trifoliatum*, and says that, although the description given by Rumphius in his Herb. Amboin. v. 7. 30, belongs undoubtedly to this plant, yet that his figure must be another species, for that it has opposite, cruciate leaves, white flowers and black berries. Gærtner proposes to call it *O. alba*, but his opinion seems founded in error. The *Lignum Colubrinum* is supposed to be the root of this plant. Its serpentine form perhaps gave it the reputation of curing the bites of snakes, which it hardly retains at present.

OPHIOXYLUM, in *Gardening*, contains a plant of the shrubby climbing kind, of which the species is the scarlet-flowered ophioxylum (*O. serpentinum*.)

Method of Culture.—This may be raised by seeds, which should be sown in pots in the early spring and be plunged in a bark hot-bed, and when the plants have obtained some growth, removed into separate pots and replunged in the bark hot-bed of the stove, where the plants must be constantly kept. It may likewise be increased by layers and cuttings, which should be laid down or planted out at the

same season, and have the same sort of management as those procured from seeds.

These are ornamental stove plants.

OPHIR, in *Sacred Geography*, the place from which Solomon procured the gold and other precious articles with which he enriched himself, and adorned the temple of Jerusalem.

Concerning the part of the world in which Ophir was situated, there have been many and various opinions and conjectures; some of them extremely fanciful, not to say absurd; and others supported and elucidated with no inconsiderable portion of ingenuity and learning: still, however, the exact situation of this place is undetermined, though the opinion that it was somewhere either on the eastern or western coast of Africa seems the most plausible, and to obtain the sanction of the most learned and well-informed writers, who have discussed or adverted to this point of sacred geography.

Before proceeding to notice and explain the various hypotheses respecting the situation of Ophir, it may be proper to collect the different passages in scripture in which it is mentioned.

1 Kings, ix. 26, 27, 28. And king Solomon made a navy of ships in Ezion-geber, which is beside Eloth, on the shore of the Red sea, in the land of Edom.

And Hiram sent in the navy his servants, shipmen that had knowledge of the sea, with the servants of Solomon.

And they came to Ophir, and fetched from thence gold, four hundred and twenty talents, and brought it to king Solomon.

1 Kings, x. 11. And the navy also of Hiram, that brought gold from Ophir, brought in from Ophir great plenty of almug-trees, and precious stones.

Verse 22. For the king had at sea a navy of Tharshish with the navy of Hiram; once in three years came the navy of Tharshish, bringing gold and silver, ivory, and apes, and peacocks.

2 Chron. viii. 17, 18. Then went Solomon to Ezion-geber, and to Eloth, at the sea-side in the land of Edom.

And Hiram sent him by the hands of his servants ships, and servants that had knowledge of the sea; and they went with the servants of Solomon to Ophir, and took thence four hundred and fifty talents of gold, and brought them to king Solomon.

Chap. ix. 10. And the servants also of Hiram, and the servants of Solomon, which brought gold from Ophir, brought almug-trees, and precious stones.

Verse 21. For the king's ships went to Tharshish with the servants of Hiram; every three years once came the ships of Tharshish bringing gold and silver, ivory, and apes, and peacocks.

1 Kings, xxii. 48. Jehoshaphat made ships of Tharshish to go to Ophir for gold; but they went not; for the ships were broken at Ezion-geber.

2 Chron. xx. 35, 36, 37. And after this did Jehoshaphat, king of Judah, join himself with Ahaziah, king of Israel, who did very wickedly.

And he joined himself with him to make ships to go to Tharshish; and they made the ships in Ezion-geber.

Then Eliezer, the son of Dodavah of Marebath, prophesied against Jehoshaphat, saying, because thou hast joined thyself with Ahaziah, the Lord hath broken thy works. And the ships were broken, that they were not able to go to Tharshish.

The authors of the Ancient Universal History consider the various marks by which the scriptures seem to lead us to Ophir, as so palpable and striking, that they are sur-

prised the discovery of its situation should be so very difficult, and have given rise to so much discussion and controversy: these marks they thus class and enumerate: 1. That Moses speaks of Ophir, the son of Joktan, who went with his brethren, and dwelt from Mesha, toward Sephar, a mount of the East. (Gen. x. 29, 30.) 2. That the same fleet went both to Ophir and Tharshish, and set out from Ezion-geber, a sea-port near Eloth, in the land of Edom, upon the Red sea. 3. That the voyage took them up three years. 4. That it brought gold, precious stones, spices, ivory, ebony, almug-wood, peacocks, and monkeys. 5. That Ophir not only afforded the greatest quantity of gold, but that it also exceeded all other gold in fineness and value. To these marks of the situation of Ophir, supplied by scripture, they add that, according to Eupolemus, an ancient author, quoted by Eusebius, the Urphe, or Ophir, from whence this gold was brought, was an island in the Red sea; not that sea, which is commonly understood by that appellation, which lies between Arabia and Egypt, but the great Southern ocean, which extends between India and Africa, and washes up to the coast of Arabia and Persia, and which was called the Red sea, from the colour which the perpendicular sun-beams gave it in those hot climates. Ancient Universal History, vol. iv. p. 102. note R.

Now it appears to us, that in these observations there are several circumstances taken for granted, which are by no means warranted by the authority of those passages in scripture, which we have quoted, as containing all the information respecting Ophir which the holy writings afford us: and as all the hypotheses respecting the situation of this place proceed on the truth of these circumstances, it may be proper to examine into it with some degree of caution and attention.

In the first place, the passages in scripture by no means warrant the opinion, that the same vessels which made a voyage to Ophir, at the same time went to Tharshish; and that these two places lay nearly in the same direction, and therefore must be sought for, either in the same, or an adjoining country; or, at least, in the course of the voyage which the ships of Solomon and of Hiram made. An examination and comparison of the passages from Kings and the Chronicles, which we have quoted, will sufficiently prove that there is no foundation for this opinion: the utmost they can be said to prove is, that Solomon sent ships to Tharshish as well as to Ophir; and the words in 1 Kings, x. 21: for the king had at sea a navy of Tharshish, with the navy of Hiram, seem to indicate that there were two distinct fleets sent out on two distinct voyages. It may also be remarked, that if the same fleet went at the same time to Ophir and Tharshish, the commodities brought from these places could not have been so clearly distinguished as they are, nor would the fleet have been called, as it is exclusively, the navy of Tharshish.

But, in the second place, there seems good reason for doubting whether Solomon sent ships to Tharshish, or if he did, whether Tharshish was not very near Judea, and merely a depôt for the merchandize of more distant countries, which was brought there by the vessels of that place. This opinion, though attended with some difficulties, and opposed by some passages in scripture, is evidently and directly supported by other passages, and is more consonant with what we know, from other sources, respecting Tharshish.

By the expression employed 1 Kings, x. 22: for the king had at sea a navy of Tharshish, it is more reasonable to understand that this navy was either hired from

Tharshish by Solomon, or was composed of ships built after the manner of the ships of that place, than that it was a fleet which had sailed for Tharshish: the first of these suppositions is supported by the context, the navy of Tharshish being mentioned immediately in connection with the navy of Hiram, which seems to imply, that as the latter was lent to Solomon by that monarch, the former was procured from Tharshish. The other idea, that by the navy of Tharshish is meant, ships built after the manner of the ships of Tharshish, is countenanced by the passage in 1 Kings, xxii. 48. Jehoshaphat made ships of Tharshish to go to Ophir for gold. At any rate, these passages are directly against the opinion, that Tharshish was a very distant place, which was visited by the ships of Solomon at the same time that they went to Ophir.

There are, however, two passages which favour the opinion that Solomon and Jehoshaphat sent ships to Tharshish, though they by no means prove the great distance of this place, nor that it was visited at the same time with Ophir. In the passage of Chronicles, which corresponds with 1 Kings, x. 22, the navy of Solomon, instead of being called the navy of Tharshish, as in the latter passage, is said to have gone to Tharshish, with the servants of Hiram: and in 2 Chron. xx. 36, which corresponds with 1 Kings, xxii. 48, Jehoshaphat is said to have joined himself with Ahaziah, king of Israel, to make ships to go to Tharshish, and not, as in the passage of Kings, to make ships of Tharshish to go to Ophir for gold.

As these passages seem not to accord very well together, and consequently cannot be brought forward of themselves absolutely to determine whether Tharshish were a distant country, visited by Solomon's ships, at the same time that they made their voyage to Ophir; or whether Solomon merely hired vessels from Tharshish, a neighbouring city or territory, or built his own vessels on the model used here, it will be necessary to examine other passages, in which Tharshish is mentioned. It may fairly be inferred, that as the Tharshish spoken of, in the passages already quoted, is not particularized by any epithet, or circumstance, to distinguish it from the Tharshish mentioned repeatedly in other parts of scripture, that it is the same place; certainly, if it had been a very distant and comparatively unknown place, it would have been so distinguished from the Tharshish that was familiar to the Jews.

Tharshish was the son of Javan, and according to the opinion of Josephus, his descendants first peopled Cilicia, whence the whole country, as well as the city of Tarsis, took its name. That this place was celebrated for its ships and commerce, and that it was visited by the Jews, the following passages, besides others, will sufficiently prove. In the 27th chapter of Ezekiel, where the prophet foretells the destruction of Tyre, he expressly mentions Tharshish as one of the places which traded with that city: ver. 12. Tharshish was thy merchant, by reason of the multitude of all kinds of riches; ver. 25. The ships of Tharshish did sing of thee in thy market. And that this Tharshish, thus celebrated for its ships and commerce, was at no great distance from Tyre, appears from the 23d chapter of Isaiah, ver. 6. where the prophet is also foretelling the miserable overthrow of Tyre, "Pass ye over to Tharshish; howl, ye inhabitants of the isle." In the first verse of the same chapter also, the connection and intercourse of Tharshish with Tyre is pointed out, in these words, "Howl, ye ships of Tharshish, for it (Tyre) is laid waste." But the vicinity of Tharshish, and the intercourse with it, are still more clearly pointed out in the second verse of the first chapter of Jonah; "But Jonah rose up to flee unto Tharshish from the

the presence of the Lord, and went down to Joppa; and he found a ship going to Tharshish: so he paid the fare thereof, and went down into it, to go with them unto Tharshish, from the presence of the Lord."

It seems, therefore, fair to conclude, that the Tharshish mentioned in the passages cited from Kings and the Chronicles, is the same place, known under that name, in other parts of scripture: it evidently was a place of great commerce, and famous for its ships; and though it may be granted that Solomon and Jehoshaphat traded with Tharshish, and did not merely hire vessels from the merchants there, or build them after the models of that place, (though, as we have seen, there are passages in scripture which countenance these opinions), yet there is certainly no evidence that the fleet which visited Ophir, at the same time visited Tharshish, or that the voyage to these places lay in the same track.

In the last place, the marks respecting the situation of Ophir, drawn from the supposed length of the voyage, are equally unsupported by the passages quoted from scripture. Even allowing that the navy of Solomon was three years on its voyage to Tharshish, this circumstance would not serve as a guide to ascertain the position of Ophir, unless it had been proved that the voyage to the two places was performed at the same time; and we have shewn that there is no ground for this opinion. But as the alleged length of the voyage to Tharshish may seem to militate against the idea, which we have thrown out, that this place was in Cilicia, and that, if resorted to by Solomon's ships, it was resorted to only as a dépôt for merchandize, not as the native country of the commodities brought from it, it will be proper to examine on what authority it has been so generally maintained, or rather taken for granted, that the voyage to Tharshish occupied the space of three years. The passages have been already given, but it will not be amiss to quote them again. 1 Kings, x. 22: for the king had at sea a navy of Tharshish with the navy of Hiram: once in three years came the navy of Tharshish, bringing gold and silver, ivory, and apes, and peacocks. 2 Chron. ix. 21: for the king's ships went to Tharshish with the servants of Hiram; every three years once came the ships of Tharshish, bringing gold and silver, ivory, and apes, and peacocks. Now, certainly, to read these passages with the eye of common sense, without attachment to, or knowledge of, any hypothesis on the subject, the sum of the inferences that could reasonably be drawn from them would simply amount to this; that Solomon had a supply of the commodities mentioned in them, once in three years; there is no assertion made, no intimation given, no reason supplied for drawing the inference, that the voyage to Tharshish occupied three years. This interpretation of these passages, so plain, obvious, and consistent in itself, must derive considerable support from the facts, that Tharshish is frequently mentioned in other parts of scripture, as at a short distance from Judea, as famous for its shipping and commerce, and as having kept up a direct and frequent intercourse with Joppa, one of the principal sea-ports of Hiram, from whom Solomon received one of his fleets, or at least, seamen to navigate it on its voyage to Ophir. The general conclusions, therefore, which we should be disposed to draw, are, that whatever may have been the distance and situation of Ophir, they ought not to be sought after on the idea that this place and Tharshish lay in the same route, and were visited on the same voyage; nor that the voyage occupied so long a period as three years; and that, in order to procure gold and the other commodities enumerated in the passages cited, Solomon sent directly to

Ophir, in his own ships, in those of his friend and ally, Hiram, king of Tyre, or in the ships of Tharshish, which he probably procured through Hiram, who had regular and extensive commercial intercourse with that place; while, at the same time, Solomon traded directly with Tharshish, one of the principal dépôts for the merchandize in the Mediterranean.

Having thus thrown out our own ideas on one point of this question, we should now proceed to state the various hypotheses respecting the situation of Ophir; all of which it will be seen proceed on the assumptions, that Tharshish lay on the same route with it, was visited at the same time, and that the voyage occupied a space of three years: but it may be proper to premise some miscellaneous observations, which will clear the way for the more accurate and satisfactory statement of these hypotheses.

Ophir must have been visited long before the time of Solomon; since the gold of Ophir is particularly mentioned in the book of Job, chapter xxii. verse 24. "Then shalt thou lay up gold as dust, and the gold of Ophir as the stones of the brooks;" or, as it is otherwise translated, "Then shalt thou lay up gold as dust, and wealth as in the brooks of Ophir," and in the 45th Psalm, verse 9, "Kings' daughters were among thy honourable women: upon thy right hand did stand the queen in gold of Ophir." That the gold of Ophir was in great plenty in Judea, in king David's time, appears from this circumstance, that he left 3000 talents of it for the service of the temple, besides the 5000 talents which the princes of the people offered for the same purpose. (1 Chronicles, xxix. 4, &c.) And, as the authors of the Ancient Universal History remark, we can hardly believe, that either David or the princes gave more than a certain proportion of it; supposing that it was a third part of all they possessed, there must have been at least 24,000 talents of that metal in the kingdom. On this head, it may be remarked, that the Talmud reckons seven kinds of gold, of which the gold of Ophir was the most celebrated, and the most abundant. Tract. Joma, fol. xlv. p. 2.

Although the situation of Ezion-geber seems plainly and satisfactorily pointed out, yet some authors are of opinion, that it was not a port on the Red sea, but on the Mediterranean: this opinion they seem to have embraced, in order to avoid the difficulty which puzzled Huet, and which led him to maintain, that the canal of communication between the Red sea and the Mediterranean was opened in king David's time. It is certain, that in the time of Solomon there was some mode of communication, by means of ships, between Ezion-geber and the Mediterranean; for even allowing that Tharshish was on the east coast of Africa, and, therefore, could be reached by vessels from the Red sea, without the necessity of going round Africa, yet it is not easy to imagine by what means Hiram sent the vessels, with which he accommodated Solomon, from Phœnicia to the Red sea, unless we suppose, with Huet, that there was at that time a canal between the two seas. (2 Chron. viii. 18.) But whatever difficulty there may be in finding a passage from Ezion-geber to the Mediterranean, that place cannot have been situated any where, except on the Red sea, as there is not a single passage in scripture in which Yam suph signifies the Mediterranean, or any other but the Red sea. Indeed, there is good reason for believing that by Yam suph, the Heeropolitan gulf, or upper part of the Red sea, was particularly designated. (Ancient Universal History, vol. xviii. p. 366. note M.) Besides, Ezion-geber is expressly said to have been near Eloth, and this city is always placed on the Red sea.

The almug-trees, which were part of the cargo brought from

from Ophir, are called by the rabbins coral wood, and are said to have resembled coral in hardness, colour, and polish; by Lemery, it is said to have been a species of wood which he calls grenadille.

The first hypothesis respecting the site of Ophir, which we shall notice, places it in Peru; this opinion is maintained by the rabbi David Ganz, and by several other authors, mentioned in the *Ancient Universal History*, vol. iv. p. 102. n. R. The grounds on which this opinion is rested are extremely fanciful, independently of the extreme improbability, that in the time of Solomon any knowledge existed of America, much less any intercourse with it. The gold of Ophir seems, 2 Chron. iii. 6. to be called the gold of Parvaim; for speaking of the ornaments of the temple, which in other places are said to have been of the gold of Ophir, Solomon, in this passage, is said to have garnished the house with precious stones for beauty, and the gold was the gold of Parvaim. On this idea, that the gold of Ophir and of Parvaim were the same, and that, consequently, these were two names for the same place, the opinion that Ophir was in Peru has been principally founded; Parvaim being supposed to bear some resemblance in sound, and in letters, to Peru. It is hardly necessary to expose the absurd futility of this fancied resemblance. Another mode of supporting this hypothesis is equally ridiculous, viz. that the Hebrew word Ophir, and Peru expressed in Hebrew letters, are composed of the same letters, though differently arranged. On this hypothesis it is not worth while to waste any more time, except merely to remark, that according to sir Walter Raleigh, Peru is not the true name of that country, but was given it by the Spaniards, in consequence of their mistaking the answer of the natives to a question they did not understand: the Spaniards asking them what country, the Indians answered Peru, or Beru, what do you say; hence the Spaniards concluded, that Peru was the name of the country.

Josephus and others, having observed that the ships sailed from the Red sea, place Ophir in the Indian ocean, and suppose it to be the ancient Taprobana, or the Chersonesus Aurea, the land of gold. If it were Taprobana, it must have been the island of Ceylon, for there is good reason for supposing, that that island was known to the ancients by the name of Taprobana. The Aurea Chersonesus probably was the peninsula of Malacca. But there are several weighty objections to this hypothesis: in the first place, the name of Ophir has no affinity to any of these islands, though Parvaim is supposed to resemble Taprobana in sound; a supposition which only shews on what slender grounds hypotheses are frequently built. But in the second place, if Ophir had been situated any where on the Indian seas, the gold and merchandise for which it was famous would not have been brought by sea, but by caravans, by means of which all the Asiatic commodities were introduced into the countries bordering on the Mediterranean, before the discovery of the Cape of Good Hope.

The authors of the *Ancient Universal History* are disposed to place Ophir "in some of those remote rich countries in India, beyond the Ganges, and perhaps as far as China or Japan, which last still abounds with the finest gold, and with several other commodities in which Solomon's fleet dealt, as silver, precious stones, ebony, and other valuable sorts of wood, to say nothing of spices, peacocks, parrots, apes, and other such creatures; and by its distance, best answers to the length of the voyage." (*Ancient Universal History*, loc. cit.) But the objections already urged against the last hypothesis, lie with equal weight against this opinion: it is not likely, that in Solomon's time such a

distant voyage could have been undertaken, in the course of which, the only secure and usual manner of navigation practised among the ancients, viz. sailing along the coast, could not here have been practised; and long before the period and direction of the monsoons, which in after ages were taken advantage of in order to sail across from the Red sea to the coast of Malabar, were ascertained. If the commodities obtained by Solomon actually came from the distant parts of India, they must, as has been already observed, have been brought by caravans. The passage in Genesis has been already mentioned, in which Moses informs us, that the habitation of Joktan's sons was from Mesha, as thou goest unto Sephar, a mount of the east. As Ophir was one of Joktan's sons, a hypothesis respecting the situation of Ophir has been built on this passage; this hypothesis is principally supported by Calmet; he supposes it was placed somewhere towards Armenia and Media, where the Tigris and Euphrates take their rise; and these rivers, he thinks, might have been subservient to the commerce which was carried on. Calmet argues in favour and support of this hypothesis with considerable ingenuity and learning; but it certainly does not rest on any solid foundation. If Ophir were situated near the rise of the Tigris or Euphrates, the vessels of Solomon could hardly have reached it; and if the merchandise were brought down to the ships at the mouth of these rivers, it would not have been said that they sailed to Ophir. As the commonly received opinion, that the voyage to Ophir occupied a space of three years, militates against the hypothesis, that it was situated so near to Judea, as Armenia or Media, Calmet supposes, that the three years mentioned in the text might mean only three summers, and two winters, or thirty months.

Dean Prideaux offers his conjectures, on the supposition, that it was the voyage to Tharshish only, and not the voyage to Ophir, or to Ophir and Tharshish together, which took up three years going and coming; hence he concludes, that Ophir might be much nearer Judea than Tharshish, and that the voyage to it might have been performed in a much shorter space of time than three years, if they had not been obliged to go to Tharshish for some commodities, with which Ophir could not supply them; hence he infers, that any place in the Great Indian sea, at the distance of three years' voyage, which yielded gold, silver, ivory, apes, and peacocks, might be the Tharshish; and any other, though much nearer, where they could have gold, almug-trees, and precious stones, might be the Ophir mentioned by the scriptures; and he attempts to shew, that the southern part of Arabia produced the greatest quantities of the best gold, and, consequently, might be the land of Ophir. Against this hypothesis, the objection already stated lies with great force. As a constant commercial intercourse was kept up between India and the more distant parts of Asia, and the countries on the Mediterranean, by means of caravans, it is by no means probable, that vessels could be employed for this purpose; hence, wherever Ophir may have been situated, it ought not to be sought for in the Indian ocean, or in any part of Asia.

Against this opinion of dean Prideaux, the remarks of the authors of the *Ancient Universal History* also strongly militate. "Though it be granted (they observe) that Tharshish and Ophir might be distinct places, and at some considerable distance from each other; yet, if the latter had been so nigh as South Arabia, and had yielded such plenty of the finest gold, almug-trees, and precious stones, it is scarcely probable, that they would have gone so much farther for such inferior trifles as silver, ivory, monkeys, and peacocks; it is more likely that they went farthest for the fine gold, precious

cious stones, and things of the greatest value." Ancient Universal History, vol. iv. p. 105. note R.

Having thus considered the various hypotheses, which proceed on the idea, that Ophir was situated either in South America, or the continent of Asia, or in some of the Asiatic islands, and proved how little foundation there is for any of them, even on the supposition that Ophir and Tarshish were visited on the same voyage; that Tarshish was not the Tarshish of Cilicia, but a much more distant and less known place; and that the space of three years was occupied in the voyage to Ophir and Tarshish; we shall now proceed to state, and consider that class of hypotheses, which look for these places either in Africa alone, or in Africa and Europe.

The opinion that Ophir was Sofala, a territory or town of Africa, opposite to the island of Madagascar, has been long held, as we learn from Bochart (lib. ii. cap. 27. p. 160.) Sofala is thought by Moquet to be the Sopheira of the Septuagint, and he grounds his opinion on the fact, that liquids are often put for one another, so that Sopheira and Sofala might be used indiscriminately as the name of the same place. Lopez, in his Indian Voyage relates, that the inhabitants of the country near Madagascar, boast that they have books which prove, that in the time of king Solomon the Israelites made a voyage thither every third year to fetch gold. In the *Mélanges de Géographie et d'Histoire naturelle*, par Zein-eddin Omar, fils d'About Modhaffer, surnommé Ebn al-ouardi, écrivain du xiii siècle, of which an account is given in *Notices des MSS. du Roi*, tom. xi. p. 40. Sophala is called Sophala eddhabab, or the Golden Sofala. This opinion is strongly and learnedly supported by D'Anville, in his *Dissertation sur la Pays d'Ophir*, published in the *Mémoires de Littérature*, tom. xxx. p. 83, &c. But it has received the most ample and elaborate elucidation by Bruce, in the second book of his *Travels*, c. 4, who seems to have convinced Dr. Robertson, (*Historical Disquisition concerning India*, p. 10.) It will, therefore, be proper to consider this hypothesis, as supported and elucidated by Bruce, at some length.

He commences his investigations and reasonings on this subject, by laying down three positions; 1st. That the trade to Ophir was carried on from the Elanitic gulf, through the Indian ocean; 2dly. That gold, silver, and ivory, but principally silver, were the commodities obtained by this trade; and 3dly. That the time occupied in this voyage in going to Ophir, and returning from it, was precisely three years.

The great difficulty with Mr. Bruce arises from the supposed length of the voyage; for it does not seem probable, that three years would be consumed in going from the Red sea to the Mozambique channel, and in returning to Ezion-geber, even in the imperfect state of navigation in Solomon's time. In order to obviate this difficulty, Mr. Bruce has recourse to the obstacles to the voyage, which the monsoons of the Arabian gulf would throw in the way of these inexperienced navigators. Before proceeding to point out how the monsoons would lengthen the voyage exactly to the period of three years, he adduces some collateral arguments to prove that Sofala was famous for its gold mines. According to John Dos Santos in 1568, he sailed up the river Cuama, as far as Tete; from this place, he penetrated nearly 200 miles into the interior of the country, where he saw gold mines working at a place called *Afura*; still farther up the country, he understood that the silver mines of Chicoua were situated: at both places there were appearances of the mines having been wrought for a long series of years, and large remains of masonry buildings.

Mr. Bruce supposes, that the fleet of Solomon left Ezion-geber in the month of June; at this season of the year the

northern monsoon prevails, which would carry the ships as far as Mocha; at this place, the course of the gulf changing, though the monsoon continued to blow in the same direction, it would be no longer favourable for the prosecution of the voyage. The fleet, therefore, he supposes, would anchor in the harbour of Mocha. In the month of August it would be again able to proceed, and clear the straits of Babel-mandeh. After this, its course was nearly south-west; and as at cape Gardafan the wind at this time of the year blows from that quarter, the fleet would be obliged to anchor under the cape, or in a port near it, which was afterwards called Promontorium Aromaticum. Here it was detained till the month of November, but during this stay, Mr. Bruce supposes, that ivory, frankincense, and myrrh were purchased, as part of the cargo, for which the fleet was sent out. In the month of November the wind changes to north-east, and as this was extremely favourable to the fleet, the course of which was still south-west, it again proceeded on its voyage, which would have soon been completed, but off Melinda, towards the beginning of the following month, an irregular monsoon sets in from the south-west, and, consequently, directly in the teeth of the ships. This change in the wind compelled the seamen to put into port; and at this place, near Melinda, a city or district is situated, called Tarshish; this Mr. Bruce considers as a strong corroboration of the accuracy and truth of this opinion, both with respect to the situation of Ophir, and with respect to the time and course of the voyage thither. But the evidence on which this author endeavours to prove, that a place called Tarshish or Tarshish was situated near Melinda, appears to us very slight and inconclusive. The *Annals of Abyssinia* mention, that Amda Icon, making war on that coast in the 14th century, gives a list of the rebellious Moorish vassals, and the chief of Tarshish is particularly noticed, in the very place where Mr. Bruce places that city or district. But it is hardly just to infer the name of a place in Solomon's time, from the name which it bore in the 14th century, besides the probability, that, as this Tarshish was governed by a Moorish chief, the name was given it by that nation, from the place whence they derived their origin. At this place, which Mr. Bruce supposes to have been Tarshish, the fleet were obliged to stay till the month of April of the second year; at the end of that month, or towards the beginning of May, the wind comes round to the north-east, and as the distance to Sofala was now very trifling, the fleet probably reached its ultimate destination the same month that it left Tarshish. As the north-east monsoon continues from May till October, the fleet would be detained all this time at Sofala; in the beginning of November, the south-west monsoon sets in, and with this it fails on its return to the Red sea. This monsoon, Mr. Bruce supposes, would carry it as far as Melinda or Tarshish, when the north-east monsoon would again meet it, and would oblige it to put into port, and remain there till the south-west wind sprung up in the month of May, of the third year of its voyage. This wind would continue till the fleet arrived within the straits at Mocha, where it would be again detained by the summer monsoon, blowing directly in its teeth from Suez. In October or November, the adverse northerly monsoon gives way to a south-east wind, which would carry it up into the Elanitic gulf, towards the end of December of the third year.

Setting aside all objections to this ingenious mode of explaining and defending his hypothesis, founded on the opinion, which we have already repeatedly stated, that there is no evidence that Tarshish was visited during the voyage to Ophir, or that the voyage occupied three years, it is too obvious,

obvious, that Mr. Bruce has accommodated the circumstances and duration of this supposed voyage to his preconceived notions; and after all the duration cannot properly be said to have been three years, as the fleet is supposed to have left Ezion-geber in the summer, and to have returned in the December of the third year; besides, if the account of the direction and period of the monsoons, as given by Mr. Bruce, when the fleet was outward bound, be compared with the account of their direction and continuance, when it was homeward bound, they will not be found to accurately agree.

The last hypothesis which we shall notice, supposes that the fleet of Solomon, in its voyage to Ophir and Tarshish, actually sailed round the Cape of Good Hope, and came to Joppa, by the Mediterranean. This hypothesis is supported by Huet: he thinks that Ophir was a general name for all the Oriental coast of Africa, particularly of the country of Sofala; in this respect agreeing with Bruce; and that Tarshish was also a general name for all the occidental coast of Africa and Spain, and in particular of that coast in the neighbourhood of the mouth of the river Guadalquivir, a country fertile in mines of silver; he also maintains that the Cape of Good Hope was known, often frequented, and doubled in Solomon's time, and for many years afterwards. *History of Commerce and Navigation*, p. 19, 20.

A writer in the *Gentleman's Magazine* (for 1786, p. 28.) coincides in opinion with Huet that the fleet of Solomon in its voyage doubled the Cape of Good Hope, and he places Ophir on the west coast of Africa; Guinea and Negroland he supposes to have been the places visited by Solomon's fleet. In support of this opinion, he offers, however, but weak and fantastical arguments. One of them is, that the Hebrew words, which signify *dust* and *ashes*, make up the etymon of Ophir; and as gold dust principally is found in Guinea, and Eliphaz in his exhortation to Job, tells him he shall lay up gold as dust, and the gold of Ophir as the stones of the brooks, he infers that Ophir is to be sought for in Guinea: another of his proofs is drawn from the circumstance that circumcision is used among the negroes of the Gold Coast, which may have been introduced here by the Hebrews.

But the opinion that the fleet of Solomon, in its voyage to Ophir and Tarshish, circumnavigated Africa, is most strongly and ably supported by Dr. Doig, formerly master of the grammar school at Stirling, and the author of the letters, addressed to lord Kames, on the Savage State.

He supposes that there were several places called Ophir; that the original Ophir, so named from the son of Joktan, was situated at no great distance from Judea, and that it was from this Ophir that the gold mentioned in Job was obtained. As the original Ophir abounded in gold, this name was applied to several other places, where that metal was found in great plenty; but that the Ophir of Solomon was not, as Mr. Bruce maintains, situated on the south-east coast of Africa, because the fleet, in the very same voyage, touched at Tarshish, which lay in a very different quarter.

In order, therefore, to ascertain the site of Ophir, Dr. Doig deems it necessary previously to fix the situation of Tarshish: this name was also given to many places: the original Tarshish was situated on the western coast of Asia Minor: but this original Tarshish, Dr. Doig contends, was not the Tarshish of Solomon. This place, according to him, was situated in Spain, in that part of it in which Huet places it; viz. in Spanish Bætica, near the mouth of the Guadalquivir. It appears from Isaiah and Ezekiel that the merchants of Tarshish traded in the markets of Tyre with silver,

iron, lead, and tin; and Jeremiah expressly says, "silver spread into plates is brought from Tarshish:" but that part of Spain which lies on the river Guadalquivir, was famous among the ancients for its mines of silver. Besides, the river Bætis, which divides Bætica, is called *Tartessus* by Aristotle, Strabo, and several other authors; and in this neighbourhood were a lake and city of the same name. Dr. Doig next proceeds to prove that Tartessus and Tarshish are the very same name; the Phœnicians changing the *schin* into *thau*, made the latter word Tartish.

Having thus fixed the situation of Tarshish, Dr. Doig next proceeds to ascertain the position of Ophir. This he concludes to have been on the coast of Guinea. In reply to the objection, that the fleet of Solomon would not have gone so far as the west coast of Africa for gold, he replies that at this time no gold was to be found on the eastern coast: but his argument on this point evidently proceeds on taking for granted his own hypothesis. If they had found gold (he observes) on any part of the eastern coast, they would have returned to Ezion-geber, and not proceeded round Africa, merely for the purpose of trading at Tarshish, but as they did not find gold on this coast they were obliged to double the Cape, and then it was more easy to proceed home by Tarshish, than by the route according to which they came. After having completed their cargo at this latter place, Dr. Doig supposes the fleet sailed for Joppa; and that the next voyage was reversed, i. e. they first visited Tarshish in Spain, then Guinea, and so doubled the Cape, and returned along the eastern coast of Africa, and up the Red sea, to Ezion-geber.

Both Dr. Doig, and the writer in the *Gentleman's Magazine*, endeavour to support their opinion, that the fleet of Solomon circumnavigated Africa, by the account which Herodotus gives of the voyage round the Cape of Good Hope, which was performed during the reign of Necho, king of Egypt. According to this historian, the fleet sent out by that monarch was navigated by Phœnician mariners; it failed from a port in the Red sea; it returned by the straits of Gibraltar; and it was exactly three years in its voyage. The truth of this narration by Herodotus has been questioned; but in our opinion, without any solid reason; indeed the circumstance, which he mentions with astonishment and some degree of incredulity, as having occurred during this voyage, viz. that in one part of the course the shadows fell on the right hand, is so unlikely to have been an invention of the mariners, so dissimilar to all the marvellous stories related of distant countries in those times, and yet so certainly true, that it alone proves that Africa had been circumnavigated, or at least that the voyage had been prosecuted beyond the line. But, we imagine, a little reflection on this voyage which is mentioned by Herodotus, will convince us that it rather makes against, than for the truth of the opinion, that the Cape was doubled in Solomon's time. As the Phœnicians were employed by Solomon, it is natural to suppose that they had gone this voyage frequently before. Indeed, both Huet and Dr. Doig maintain that the circumnavigation of Africa had been often accomplished by the Phœnicians, before they were employed by Solomon. Now the voyage performed round Africa in the reign of Necho, which Herodotus mentions, took place two centuries after the time of Solomon. But Herodotus relates it as something very extraordinary; indeed his manner would naturally lead to the supposition that such a voyage had never been performed before: if it had been performed frequently before by the Phœnicians, it is not probable that the mariners, on their return from this voyage, would have particularly mentioned the circumstance of their shadows falling on their right; nor would Herodotus

Herodotus have been unwilling to credit it, if it had been confirmed by the testimony of those who had performed the same voyage before. As, therefore, from the account of the historian, the voyage undertaken in the reign of Necho, two centuries after Solomon, was evidently no common event, we are justified in doubting, at least, whether the fleet of the Jewish monarch circumnavigated Africa, and consequently whether Ophir was situated on the west coast of that continent.

To conclude, if we are correct in the opinions we have advanced, that there is no evidence in scripture, that Ophir and Tarshish were visited during the same voyage; that the voyage to either, or both, actually took up three years; and that the Tarshish of Solomon was a different place from the Tarshish in Cilicia; it is evident that the investigations hitherto made into the situation of these places, and into the course of the voyages performed by Solomon's fleet, proceed on unsupported data; and, consequently, though some of them display great ingenuity and learning, they can only lead us astray from the real object of our research.

OPHIR, in *Geography*, a mountain of Sumatra, situated immediately under the equinoctial line, and supposed to be the highest visible from the sea; its summit being elevated 13,842 feet above that level. The following is the result of observations made by Mr. Robert Nairne concerning the height of mount Ophir: height of the peak above the level of the sea, in feet, 13842, English miles 2,6216, nautical miles 2,26325; inland, nearly, 26 nautical miles; distance from Massang point 32 nautical miles; distance at sea before the peak is sunk under the horizon, 125 nautical miles; latitude of the peak $0^{\circ} 6' N.$; a volcano mountain, S. of Ophir, is short of that in height by 1379 feet; inland, nearly, 29 nautical miles.

The idea of Sumatra being the country of Ophir, whither Solomon sent his fleets, is too vague, says Mr. Marsden, and the subject wrapt in a veil of too remote antiquity to admit discussion. The name of Ophir was given to the mountain of Sumatra by the Europeans in modern days. Another near Malacca is also so named.

OPHIRA, in *Botany*, a genus of uncertain derivation. This plant was originally discovered by Burmann in Africa. Both Jussieu and Schreber considered it as nearly allied to the *Grubbia* of Bergius; and Dr. Smith, upon examination, finds them to be one and the same plant. (See GRUBBIA.) Of course the original name remains.—Linn. Mant. 150. Schreb. 259. Willd. Sp. Pl. v. 2. 414. Mart. Mill. Dict. v. 3. Juss. 321. Lamarck Dict. v. 4. 565. Illustr. t. 293.—Class and order, *Obandria Monogynia*. Nat. Ord. *Onagras*, Juss.

Gen. Ch. *Cal.* Involucrum of two lateral, kidney-shaped, emarginate, conduplicate, permanent valves, containing three flowers. *Cor.* superior, of four, oblong, converging petals. *Stam.* Filaments eight, the length of the corolla; anthers ovate. *Pist.* Germen inferior, turbinate, hispid, style thread-shaped, shorter than the stamens; stigma emarginate. *Peric.* Berry of one cell. *Seeds* two.

Eff. Ch. Calyx a two-valved involucrum, containing three flowers. Petals four, superior. Berry of one cell.

1. *O. stricta*. Linn. Mant. 229. Lamarck Illustr. t. 293.—Native of Africa.—The stems of this little erect shrub are quadrangular, and greyish. Leaves opposite, linear or lanceolate, rather pointed, coriaceous, green above, silvery white beneath, on short stalks. Flowers axillary, sessile, lateral, opposite, capitate. Berry a little, oblong, very resinous sort of cone, somewhat like a minute strawberry.

OPHITES, *Ophiites*, in *Natural History*, a sort of variegated

marble of a dusky green ground, sprinkled with spots of a lighter green; otherwise called *serpentine*.

It is thus called from the Greek, *οφις*; *serpent*; because its spots resemble those of that animal.

The ancients knew three species of this kind, which they call the black, the white, and the grey ophites, and this last also frequently *tephria*; and allowing these spotted variations to be the characters of an ophites, we have, beside these, two others known at this time.

The other two ophites, which seem not to have been known to the ancients, are, 1. A greyish-brown one with green spots. It is frequent in Egypt and Arabia, and is said to have been dug in England. 2. A pale grey one, with green spots and veins. It is very hard, and capable of an elegant polish. It is frequent in Germany, and tables are made of the large pieces and vases of the smaller ones. It is said also to be found in England.

OPHITES, in *Ecclesiastical History*, is also the name of a sect of ancient heretics, who sprung out of the Gnostics, in the latter end of the second century; so called from their worshipping the serpent that seduced Eve.

This serpent, they taught, was instructed thoroughly in all knowledge; and they make it the father and author of all the sciences. On which principle they founded a thousand chimeras; part of which may be seen in St. Epiphanius. See Gnostic.

They said this serpent was the Christ; that he was very different from Jesus born of the Virgin, into whom, said they, the Christ descended; and that it was this Jesus, not the Christ, that suffered. Accordingly, they made all those of their sect renounce Jesus to follow Christ.

In consequence of this opinion, they nourished a certain number of serpents, which they looked upon as sacred, and to which they offered a subordinate kind of honour and worship.

The Sethians, or Sethites, mentioned by Theodoret, were either the same with the Ophites, or very little different from them.

The leader of this ridiculous sect was one Euphrates; it had its origin among the Jews, and was of a more ancient date than the Christian religion. A part of its followers embraced the Gospel, while the other retained their primitive superstition; and from hence arose the division of the Ophites into Christian and Antichristian.

OPHIUCUS, in *Astronomy*, a constellation of the northern hemisphere; called also *Serpentarius*. See CONSTELLATION and SERPENTARIUS.

OPHIURUS, in *Botany*, so denominated from *οφις*, *a serpent*, and *ουρα*, *a tail*, because of the slender-jointed structure of the spike, is a genus of grasses, founded by Gærtner, and published by his son, in the third volume of his work on fruit and seeds, p. 3. t. 181. f. 3. The two species there described are *Rottböllia incurvata* and *corymbosa* of Linnæus. Mr. Brown, Prodr. Nov. Holl. v. 1. 206, retains the latter only as constituting the genus in question; referring the former, with some hesitation, to his own *Lepturus*, which is *Rottböllia repens* of Forster's *Prodrum*, n. 151. *Ophiurus* seems to differ from *Lepturus* chiefly in having the glume of the calyx simple, or of one leaf, instead of two parallel ones, a distinction which appears to us, in this case, rather artificial.

OPHIUSA, or OPHINZA, sometimes called *Orphisa*, in *Ancient Geography*, an island which some have confounded with the Isle of Fromentera, for an account of which see *PRYUSE Islands*. The Ophiusa was called by the Romans *Colubraria*, and the moderns have given it the name of *Moncalobrer* (Columbrates); it is situated on the coast of the kingdom of Valencia in Spain.

OPHIUSA was also, according to Pliny, the ancient name of the island of Rhodes; and according to Steph. Byz. the name of Libya.—Also, a town placed by Strabo on the southern bank of the river Tyras, 140 stadia from its mouth; it is now “Palenca.”

OPHIUSSA, the ancient name of the isle of Thenos, one of the Cyclades, according to Pliny.—Also, a small island in the vicinity of the isle of Crete, and near Hierapytna. Pliny.

OPHRINIUM, or **OPHRINIUM**, *Renn-Keui*, a town of Asia Minor, in the Troade, near Dardanum or Dardanus and Rhætium. Here was a grove consecrated to Hector. This town is mentioned by Herodotus, Strabo, and Xenophon, the last of whom says that the inhabitants sacrificed hogs and burnt them entire.

OPHRYS, in *Botany*, from *οφρυς*, the eye-brow, owed that appellation, as we learn from Pliny, to its having been used for blackening the eye-brows. His description, of the toothed leaves, does not however by any means accord with any *Ophrys* of modern botanists. Linn. Gen. 462. Schreb. 502. Willd. Sp. Pl. v. 4. 61. Mart. Mill. Dict. v. 4. Sm. Fl. Brit. 931. Brown Prodr. Nov. Holl. v. 1. 313. Swartz. Act. Holm. for 1800. 222. t. 3. f. D. Schrad. N. Journ. v. 1. 43. t. 1. f. D. Juss. 65. Lamarck Illustr. t. 727.—Class and order, *Gynandria Monandria*. Nat. Ord. *Orchideæ*.

Gen. Ch. *Cal.* Perianth superior, of three oblong, spreading, often coloured leaves. *Cor.* Petals two, oblong, smaller than the calyx. Nectary a large, convex, lobed, coloured lip. *Stam.* Filament none; anther terminating the style, of two cells in front, each containing one stalked mass of pollen, proceeding from a distinct pouch at the base. *Pist.* Germen inferior, oblong, twisted; style short, erect; stigma in front, convex, broad, below the anther. *Peric.* Capsule oblong, of one cell, with three ribs, bursting longitudinally between the ribs. *Seeds* very numerous, minute, roundish, each with a chaffy tunic.

Ess. Ch. Lip from the base of the style, spreading, convex, lobed, without a spur. Anther terminal, fixed to the style, of two cells. Masses of pollen solitary, stalked, from separate pouches at the base.

Obf. Swartz, and after him Willdenow, considers this genus as differing from *Orchis*, merely in the want of a spur. Mr. Brown has first, from the observations of Mr. Francis Bauer of Kew, detected a very curious character, by which the genuine species of *Ophrys*, resembling the bodies of various insects in the form and colours of their lip, and forming a most natural genus by themselves, are kept separate. This character consists in the origin of the stalked masses of pollen, each from a separate pouch or bag. In *Orchis* they both spring from a single one; in *Habenaria*, to which *Orchis bifolia* belongs, there is no such pouch at all at the base of the anther.

We have three of these plants wild in Britain, *O. muscifera*, Engl. Bot. t. 64; *apifera*, t. 383; and *aranifera*, t. 65. They are found in chalky ground, the first and the last but rarely. The *apifera*, commonly called the Bee Orchis, is less unfrequent, and sometimes abounds in dry gravelly pastures, where it blossoms in July. Several exotic species have been adopted by Willdenow from Cavanilles and others; and some have been recently published by Desfontaines, (from the drawings of Tournefort's plants in the Museum at Paris,) in the *Annales du Museum d'Histoire Naturelle*, v. 10. We are not possessed of sufficient materials at present to give a detailed history of the whole; because we cannot confront the specimens of the different authors who have laboured at this subject, and who seem, in some instances, to have described the same thing under different names.

OPHRYS, in *Gardening*, comprises plants of the bulbous-rooted perennial kind, of which the species cultivated are; the common ophrys, or twayblade (*O. ovata*); the spiral ophrys, or triple ladies traces (*O. spiralis*); the bird's nest ophrys (*O. nidus-avis*); the fly ophrys (*O. muscifera*); the bee ophrys (*O. apifera*); the spider ophrys (*O. aranifera*); the yellow or musk ophrys (*O. monorchis*); and the man ophrys (*O. anthropophora*).

The first sort varies with three leaves.

And of the fourth sort there are several varieties, as the fly-shaped; the great fly; the large green fly; the blue fly; and the yellow fly.

The sixth species is fancied by some to resemble a bee, by others a spider; from the breadth of the lip, and its being marked with different shades of brown, it derives its resemblance to the latter. Others have discovered a likeness to a small bird in the flower.

The eighth sort varies in size, and in the colour of its flowers, from yellow green to bright ferruginous.

Method of Culture.—All these plants may be introduced into the different parts of pleasure-grounds from the places where they grow naturally in this country, and be preferred; but they do not admit of being propagated in them; the proper period for this purpose is just before the stalks decay, in the latter end of summer or beginning of autumn, as at that season the bulbs will be in the best state for growing strong and flowering the following year. The roots should be taken up with large balls of earth round them, and be planted again as soon as possible. They should always be placed so as that the soils and situations may be as nearly as possible similar to those from which they were taken; those taken from woods being planted out in shady situations; those from boggy or marshy places, in the more moist and boggy parts; and those from dry elevated situations, in such as have the greatest degrees of dryness and are the most open. They should afterwards be as little disturbed as possible by any sort of culture: with this sort of management the roots will often continue for several years, flowering annually during the summer.

But in the culture of the sixth sort, Mr. Curtis succeeded by taking them up from their natural situations when in flower, and baring their roots no more than was necessary to remove the roots of other sorts of plants; then filling large sized garden-pots, with three parts good moderately stiff loam, and one part chalk mixed well together, passing them through a sieve somewhat finer than a cinder-sieve, afterwards planting the roots in them to the depth of two inches, and, where there is more than one, three inches apart, watering them occasionally during the summer season, in dry weather, and on the approach of winter placing the pots under the protection of a frame and glasses, in order to prevent their being injured by wet or frosts.

All the plants afford variety, and are highly ornamental in the clumps, borders, and other parts of shrubberies, &c.

OPHTHALMIC, in *Anatomy*, from *οφθαλμος*, the eye, a term applied to parts connected with the eye, as the artery, vein, nerve, ganglion, &c.

OPHTHALMICS, medicines proper for diseases of the eyes.

Such are ophthalmic waters. (See **WATER**.) Ophthalmic powders, ointments, &c. There is an excellent ophthalmic prepared of *saccharum saturni*.

OPHTHALMODYNIA, from *οφθαλμος*, and *δυνω*, pain, an itching burning pain in the eye, without redness, and without any material increase of sensibility.

OPHTHALMOGRAPHIA, formed from *οφθαλμος*, eye, and *γραφω*, I describe, that branch of anatomy which considers

considers the structure and composition of the eye, the use of its parts, and the principal effects of vision.

Our countryman Dr. William Briggs has published an excellent ophthalmographia, and Plempius another.

OPHTHALMOPONIA, from *οφθαλμος*, and *πονειν*, *to labour*, an intense pain in the eye, rendering light intolerable.

OPHTHALMOPTOSIS, from *οφθαλμος*, and *πτωσις*, *a fall*, a protrusion or displacement of the eye. See **EXOPHTHALMIA**.

OPHTHALMORRHAGIA, from *οφθαλμος*, and *ῥεω*, *to flow*, bleeding from the eye or eye-lid.

OPHTHALMOSCOPIA, that branch of physiognomy which considers a person's eyes and looks; to deduce thence the knowledge of his temperament, humour, and manners.

OPHTHALMOXYSTRIS, from *οφθαλμος*, and *ξύστιρον*, *a brush*, the operation of scarifying the eye with a brush, as anciently practised.

OPHTHALMOXYSTRUM, a brush for scarifying the eye.

OPHTHALMY, **OPHTHALMIA**, *Ophthalmitis*, derived from *οφθαλμος*, *the eye*, is the general name by which inflammation of this delicate and important organ is expressed.

Inflammation of the eye originates in the same manner, and demands the same kind of treatment, as inflammation in other parts of the body; the general observations, therefore, which have been delivered upon this subject in the article **INFLAMMATION**, are for the most part applicable to cases of ophthalmy. In the present place it is our particular duty to consider only the peculiarities of inflammation of the eye, and the circumstances in which it differs from other ordinary inflammations.

Of all the diseases of the eye, says the experienced Richter, ophthalmy is the most frequent. There are very few diseases of the eye which do not sometimes arise from it, and in many of them it is a necessary symptom or consequence. The characteristic signs of the disorder are pain and redness: the latter is particularly remarkable, as the healthy eye exhibits no red appearance whatsoever. It does not constantly happen, however, that redness is an obvious symptom of an inflamed eye; some violent ophthalmies are said to be attended with little or no preternatural redness of the affected organ. Richter adduces, as instances, what he calls the *catarrhal*, or *rheumatic* ophthalmy, and the inflammation which chiefly affects the interior of the eye, a case that is termed *phlegmone oculi*. Besides, even when the inflamed part is considerably reddened, it frequently occurs that the change is concealed, by reason of the impossibility of making the patient open his eye. The increased redness is always most conspicuous in the white of the eye; but often in severe ophthalmies, the transparent cornea also becomes red, and bleeds, if punctured or cut. The aqueous humour has been observed to become of a red colour, an event which no doubt proceeded from extravasated blood; and sometimes small vesicles, full of this fluid, have been formed upon the cornea. The dark red swelling of the conjunctiva, attendant on violent degrees of ophthalmy, and termed *chemosis*, arises from an effusion of blood underneath that membrane. The eye-lids, likewise, not unfrequently partake of the inflammatory redness. In cases where the eye either cannot or must not be opened, it may always be inferred, that the eye-ball is inflamed, if the lower edge of the upper eyelid, or the whole of this part, should appear to be affected with swelling and redness.

The pain is the principal symptom of ophthalmy; and, indeed, when the eye cannot or must not be opened, it is the

only one. It is of different kinds. In mild ophthalmies the patients experience a sense of heat, or itching, or a sort of pressure, that seems as if it proceeded from the lodgment of a particle of sand underneath the eye-lids; but, in severe cases, the pain is of a burning, tense, shooting, throbbing description. When the patient has a sensation as if the orbit were too small, and as if the eye-ball protruded from not having sufficient room; and when he suffers, particularly about the eye-brow, a violent, oppressive, tense pain, sometimes extending from the affected side of the head to the occiput; it may be concluded, without risk of mistake, that the inflammation has attained the highest degree of violence, and that there is imminent danger of suppuration.

But even pain is not to be regarded as a constant and essential symptom of ophthalmy. There are, says Richter, some severe ophthalmies, which are accompanied with little or no pain; while certain milder cases of inflammation of the eye sometimes prove excessively painful. Examples of this kind are subject to variety. Hardy, unfeeling patients frequently make little complaint about pain, and the surgeon who trusts to their assurance, that the symptom is moderate or trifling, frequently finds, very unexpectedly, upon opening the eye-lids after a few days, the eye most vehemently inflamed, nay sometimes actually in a state of suppuration. Irritable subjects, on the contrary, often cannot bear a very slight degree of pain, and make the surgeon have recourse to means, which are in reality unnecessary. Experience proves also, that, in the majority of cases, the pain is most violent at the commencement of the inflammation, at the very moment when the disorder first originates, and that it afterwards diminishes, and even entirely subsides, notwithstanding the inflammation continues in an unabated degree. It frequently happens, after an operation on the eye, that the patient only experiences pain for a few hours in the course of the first night, and afterwards remains completely easy. The surgeon should never suffer himself to be deceived by this short duration and quick subsidence of the pain; for, under these circumstances, the eye is often found most seriously affected with inflammation. Old chronic ophthalmies are not uncommonly attended with considerable redness, and with little or no pain. Lastly, it deserves to be noticed, that the pain accompanying inflammation of the eyes is sometimes periodical. In the generality of such cases, the patients only experience pain an hour or two in the night-time, and during the day are quite free from any degree of suffering. These short paroxysms of pain, and long intervals of ease, must not be received as a criterion of the mildness of the inflammation; for the eye may yet be violently inflamed. That the eye is sometimes exceedingly painful, without being affected with inflammation, will be hereafter explained. The surgeon must not trust to any single symptom; but form a judgment from the consideration of all the circumstances of the case together.

Besides the symptoms already pointed out, there are several others, which, though they do not commonly accompany ophthalmy, sometimes do so, and consequently demand the attention of the surgeon. The inflamed eye occasionally perceives and bears the light, just as if it were in a healthy state: this is usually the case in mild and favourable ophthalmies. Sometimes the eye is so irritable, that the entrance of a very small quantity of light into it causes a profuse discharge of tears, and intolerable pain. This state of things manifests itself in severe ophthalmies, particularly in those which have been termed *catarrhal*, *humid*, &c. and are attended with a copious secretion of irritating tears. Sometimes ophthalmy is accompanied with a diminution or total loss of sight. This event is of the worst kind. The

blindness, which always indicates a violent and dangerous degree of inflammation, originates either from an opacity of the cornea, or a complete closure of the pupil, two not unfrequent consequences of severe ophthalmia: or it may proceed from the effect of the inflammation upon the retina, and, in this case, the disorder usually leaves behind it the gutta serena. See *GUTTA Serena*.

Swelling, which is an ordinary symptom of inflammation of other parts, is also sometimes observed in inflammation of the eyes, being particularly obvious in that portion of the conjunctiva which covers the white of the eye. In violent ophthalmies, this membrane swells in such a degree, that it envelopes the cornea, and lies in a thick fold between the eye-lids, protruding betwixt these parts, and hindering them from being shut. In this sort of case the whole eye-ball resembles a piece of red flesh. In severe ophthalmies, the transparent cornea likewise sometimes swells very considerably, so as to become four and even eight times as thick as it is in the healthy state. This tunic is generally rendered at the same time white and soft. When such thickening extends inward, the anterior chamber of the aqueous humour is lessened, and may be quite obliterated, the inner surface of the cornea being in close contact with the iris. In this circumstance the inflammation usually occasions a preternatural adhesion of the iris to the cornea; a disorder that is technically named *synechia*. When the thickening of the cornea projects outwardly, the affection often ends in a *staphyloma*; which see. Experience proves, however, that such thickening and opacity of the cornea sometimes entirely disappear with the inflammation, this membrane re-assuming all its proper qualities. The eye-lids also frequently participate in the inflammation with the globe of the eye, and they swell in such a degree, that it is altogether impossible to separate them from each other. In severe ophthalmies, the whole eye-ball has been observed to be affected with preternatural swelling.

In cases of ophthalmia, fever is also frequently an attendant. According to Richter, it is worthy of particular notice, that the fever is not always of one and the same kind; but presents itself under three varieties. Sometimes it is the effect of the same cause which produces the inflammation, and, in this circumstance, the same means of cure are indicated, both for the fever and the ophthalmia. The ophthalmia proceeding from disorder of the gastric organ affords an illustration of the preceding observation, emetics and purgative medicines serving, in this instance, to cure both the fever and the inflammation of the eyes. The fever is sometimes the consequence of the inflammation: here the local affection precedes the constitutional one; the latter being always in proportion to the former, moderate when it is moderate, violent when it is violent. This kind of fever requires the employment of antiphlogistic means, whereby its cause, *viz.* the inflammation, is removed, and the name of inflammatory fever is particularly applicable to it. After surgical operations on the eye, and other injuries of this organ, a fever often arises even before the slightest inflammation is discernible. It appears to be owing to the patient's apprehension before the operation, and to the pain which he has suffered, and it demands the employment of soothing anodyne means, especially opium combined with antimonials. Richter also enjoins us to be aware that the fever which attends inflammation does not always retain the type with which it first arose, but may in its course put on a complicated character, the causes of which may be in the nature of the patient's constitution, or be of an epidemic or endemial kind.

Ophthalmies, even those which are not very severe, fre-

quently produce incurable defects in the eyes; and, when we reflect upon the delicate structure of these organs, we cannot be surprised at their being so susceptible of injury. The most common consequences of violent ophthalmies are; opacities of parts naturally transparent, especially of the cornea and capsule of the crystalline lens; closure of the pupil; gutta serena; staphyloma, &c. Sometimes the inflammation occasions suppuration. It often gives rise to ulcers upon the cornea, or margins of the eye-lids. When one eye is affected with inflammation, the other seldom continues free from this affection. Also, when the ophthalmia is owing to a local external cause, the other eye frequently participates in the inflammation. When once the eye has been violently inflamed from some cause or another, it continually retains, in many instances, a tendency to fresh inflammation, and ophthalmia is re-excited by the slightest causes. In severe ophthalmies, two different stages are often observable. The first is attended with heat, and considerable pain and fever; the second is more chronic, being unaccompanied with pain or febrile symptoms. The eye is merely weakened, humid, and more or less red. This second stage of ophthalmia is frequently very tedious, and much more difficult to cure, than the first.

Ophthalmies are divided into different kinds, according to the variety in the seat of the affection, in its degree of violence, in its duration, in its external symptoms, and, more especially, in the causes of the complaint. With respect to the seat of the inflammation, it also deserves notice, that there is no part of the eye which is exempt from the risk of being inflamed, and that in severe ophthalmies, the inflammation extends over the whole eye-ball. In mild cases, however, one part suffers a good deal more, and sooner, than another. Sometimes it is the interior of the eye, which is alone, or principally affected, being the case that has been termed by writers *phlegmone oculi*. In this example the patient usually experiences a shooting pain, extending through the whole globe of the eye to the vicinity of the eye-brows, and occasioning a sensation as if the organ were ready to burst. Indeed the whole eye-ball sometimes does appear to be actually swelled and dilated. Frequently the pupil is closed; the aqueous humour bloody; and the crystalline lens rendered opaque. In still more numerous examples, the patient is deprived of the power of vision, notwithstanding the pupil be clear and uncontracted. There is little external appearance of redness about the eye. But the disorder rarely continues long in this state, a violent degree of external inflammation mostly ensuing. The preceding case of internal ophthalmia is always attended with great danger of incurable blindness.

The effects of severe ophthalmia sometimes extend to the transparent cornea, which membrane swells, and is rendered soft and white; or else blood-vessels are distinctly seen ramifying upon it; or little bloody effusions are formed over it. The eye-lids are also often affected in ophthalmia. Sometimes it is merely their inner surface which is inflamed, in which circumstance the inflammation is ordinarily very painful. In other instances, it is their margins which are chiefly affected, and then ulcerations of the tarsal, and detachment of the ciliae, not unfrequently ensue. Sometimes the whole eye-lid is inflamed; and in this case, it usually happens that the eye cannot be opened at all, or not without considerable difficulty.

The portion of the conjunctiva covering the white of the eye is generally the principal seat of ophthalmia, and it may be affected in various ways. Sometimes merely a circumscribed red spot, of different sizes and shapes, is observable in one of the corners of the eye, appearing to arise from a slight

a slight effusion of blood in the cellular substance underneath the conjunctiva, and in general it changes its situation. For instance, if it be to day at one of the angles of the eye, tomorrow it will be found at the lower margin of the cornea. Such mild inflammation is often entirely unattended with pain, and in the majority of cases the uneasiness which the patient suffers is insignificant, and in the course of a few days spontaneously disappears. The usual exciting causes of the complaint are, violent straining in vomiting or coughing, fright, a pointed extraneous body that has fallen into the eye, &c. Sometimes only a plexus of varicose vessels can be seen near the external or internal commissure, running horizontally towards the cornea. When these vessels do not reach this last membrane, the patient has no complaints, excepting a weeping of the eye, and a sensation of pressure, seeming as if it proceeded from the lodgment of some foreign body under the eye-lids. But, in certain examples, some of the vessels extend over the transparent cornea, and then it commonly happens that a cloudiness accompanies the varicose affection of the vessels, and proves a considerable impediment to vision. This case, the *ophthalmia varicosa* of surgical writers, is very obstinate, and can seldom be relieved without an operation: it is for the most part a consequence of violent acute ophthalmia.

Sometimes the white of the eye is interwoven with numerous smaller or larger blood-vessels, either at its whole circumference, or else merely in the vicinity of either angle, the vessels being plainly more or less distinguishable from one another. At the same time the patient has a burning sensation in his eye, and in general there is a copious effusion of tears. Though this kind of inflammation is not violent, it is far from being unimportant. The more numerous the red vessels are, the less distinct they are from one another; and the more uniformly red the eye appears, the more severe is the disorder. The whole of the white of the eye is sometimes not only affected with general redness, but the conjunctiva is swelled in such a degree, that it projects between the eye-lids, and even forms a protrusion beyond them; leaving in the middle of the eye-ball a deep depression, in which the cornea is situated; or else enlarged in such a manner, that this last membrane is totally covered with it. In the latter case, the whole eye-ball resembles a mass of red flesh. This species of ophthalmia, which is termed *chemosis*, is generally attended with inflammation of all the internal and external parts of the eye, vehement pain, much fever, and imminent danger of suppuration. The swelling of the conjunctiva arises from an actual extravasation of blood in the cellular membrane underneath it.

With respect to the duration of ophthalmies, they are divided into the *acute* and *chronic*. The generality of acute inflammations of the eyes at last terminate in the chronic form of the complaint. The attacks both of acute and chronic ophthalmies alternately come on and disappear at certain times, and the disorder is then termed *periodical*. All these varieties in the course of the disease permit us to draw no inferences which can be depended upon with regard to the proper mode of treatment. The same cause sometimes produces an acute, sometimes a chronic, sometimes a periodical ophthalmia. Nay, the same inflammation of the eyes frequently changes its character, becoming, in turns, acute, chronic, and periodical. From such variations also no certain information can be derived with respect to the prognosis. It is occasionally an unfavourable event, when an acute ophthalmia becomes chronic, while in other instances the change from the chronic to the acute form of the complaint is equally bad. Although chronic ophthalmies are generally not attended with much danger of the sight being

destroyed, yet they are ordinarily more difficult of cure than acute cases, because their causes are for the most part exceedingly complicated, inveterate, and not easily detected.

Ophthalmies are likewise distinguished into several kinds, by a variety of external appearances. The inflamed eye is sometimes so dry that the cornea is quite hard and scaly, and the eye and eye-lids cannot be moved without pain. It is to this case that the technical appellation of *xerophthalmia* is applied. Sometimes an extraordinary quantity of tears is discharged from the inflamed eye, the disorder being then named *ophthalmia humida*. The tears may be very acrid and irritating, or entirely free from all hurtful qualities. In particular instances the inflamed eye is neither immoderately dry nor moist. The stimulus of gentle inflammation, operating upon secreting organs, increases the secretion, by increasing the action of the vessels; but the stimulus of violent inflammation puts a stop to secretion, probably by producing a spasmodic constriction of the secreting arteries. Hence dry ophthalmies are always more severe than such as are termed humid. It is constantly a sign of mildness when the secretion of the tears is neither increased nor lessened. Ophthalmies of the dry kind are most apt to bring on suppuration of the eye; while such cases as are accompanied with an effusion of acrid irritating tears are most liable to occasion ulceration of the transparent cornea, or of the margins of the eye-lids. Sometimes the inflamed eye is covered with thick purulent matter, which, in the night-time, glues the eye-lids together, a part of it becoming hard, and adhering to the eye-lashes. This case is termed the *ophthalmia purulenta*. In this example, the Meibomian glands at the edges of the eye-lids are particularly affected, and secrete the purulent matter. The most interesting distinctions of ophthalmia are founded upon the causes of the disease, and of these notice will be taken in speaking of the mode of treating particular cases.

In the treatment of ophthalmia, there are several indications to be fulfilled. The most important one is founded upon the cause of the complaint; all the others are of inferior consequence. When the causes are numerous, the curative indications may also be so. The second most material indication is that arising from the character of the disorder, which being inflammatory, of course demands antiphlogistic treatment. Besides these two principal indications, which the surgeon must carefully and constantly attend to in the cure of ophthalmia, there are others of a collateral nature, depending upon the different appearances of the complaint, the various degrees of violence, the differences in the situation of the inflammation, the patient's constitution, &c. Although these last should not interfere with the chief means of cure, they often point out useful auxiliary measures.

We shall follow Richter, and first offer some general observations on the treatment of ophthalmia, and afterwards speak of the mode of curing each particular species of the disorder. With the exception of the humid ophthalmia, attended with an effusion of acrid tears, and chronic cases unaccompanied with pain, every inflamed eye should be kept from the light and air, which act as stimuli, so as to increase the inflammation, and prove particularly detrimental, the light producing also a great deal of pain. The usual bandage, consisting of a compress laid over the eye, and fastened with a fillet, fulfils the intention, but yet it is apt to compress and irritate the eye. The compress soon becomes wet with the tears which are discharged, and the eye and adjacent parts are kept continually in a moist state, which, in certain ophthalmies, especially the acrid humid case, is very hurtful. Richter thinks the proposal of putting over the

the eye a soft bit of sponge, instead of a compress, altogether useless; it is true that the sponge will not make inconvenient pressure on the eye, but the organ will be, as it were, in a kind of warm bath. In the majority of instances, it is unnecessary to lay a compress upon the eye itself; for when the inflammation is of any importance, the edges of the eye-lids very quickly become adherent together. In this circumstance, it is always preferable to put the compress on the forehead, and let it hang down over the eye, care being taken to fasten it with a band, or else to pin it to the patient's cap. When the eye-lids are not closed, a compress must be carefully kept on the eye. To this practice, however, there are a few cases forming exceptions. Besides guarding the eye from the light and air, it is also proper to prevent all motion of the eye and eye-lids, as such motion would evidently irritate the inflamed part. On this account, Richter conceives, that a compress, which is merely allowed to hang down over the eye, does not do in every case what ought to be done.

Both eyes, even though one only may be inflamed, ought always to be covered in one of the foregoing manners. The stimulus of the light upon the sound eye also affects the diseased one, and the latter generally moves together with the former. The compress should be frequently changed, because the discharge would soon render it hard and stiff, in which state it would prove offensive to the eye. Sometimes the eye-lids adhere so closely together, that the tears cannot escape, so that they accumulate under these parts, which become prodigiously distended, and hang down in the form of a pouch. This case is not of frequent occurrence; but it does occasionally happen, and may be mistaken by an incautious surgeon for an œdematous swelling of the eye-lids. If the eye-lids be separated a little from each other at the internal angle, the confined tears will flow out in a small stream, and the swelling of the eye-lids immediately subside. This expedient must be adopted every day, and even repeatedly, especially when the tears are sharp and irritating.

Sometimes in ophthalmies the upper eye-lid swells in such a degree, that it hangs down and covers the whole, or the greater part of the lower one. In these cases, especially when the inflammation is of a certain kind, a quantity of viscid, tough, thick matter accumulates underneath the upper eye-lid upon the external surface of the lower one, and very soon becomes so acrid and irritating, that it materially tends to keep up the effusion of tears, burning and shooting pains, and even the inflammation and swelling of the eye-lid itself. The globe of the eye is likewise liable to be injured by such a collection of discharge. In cases of this sort, it is not an unimportant rule to raise the upper eye-lid occasionally, and wash away the discharge accumulated under it. By this means, the patient usually experiences considerable relief of all his unpleasant sensations. Opening the adherent eye-lids, in cases of ophthalmia, requires some care, in order that the eye may not be irritated or otherwise hurt, particularly when the inflammation is the consequence of a surgical operation. In general, it will be found that merely the eye-lashes stick to the skin of the lower eye-lid, and consequently that, for the purpose of opening the eye, nothing more is necessary than to loosen the above hairs. The object can be best fulfilled by softening the discharge, which makes the eye-lashes adhere, with a little warm milk, or milk and butter, and then lifting them up with the end of a probe. When this is done, the eye may usually be opened with the utmost facility.

Besides the means of cure required by the foregoing indications, in cases of ophthalmia, external topical applications

may be employed with advantage. These are best in the form of an eye-water, or collyrium. Powders, blown or sprinkled into the eye, always produce irritation. Salves will not readily remain in contact with the eye, which is mostly surrounded with aqueous secretions: they only remain applied to the eye-lashes and skin of the eye-lids; and they are attended with the inconvenience of being liable, unless quite recently prepared, to produce redness, pain, and heat. Earthy indissoluble ingredients, also, should never be put into collyria; for they remain in the eye after the employment of these applications, and always occasion a degree of irritation. It appears to Richter, that the ordinary mode of using lotions for the eye by wetting compresses, and laying these over the shut eye-lids, is ineffectual and hurtful. Ineffectual, because, says this writer, how can the operation of a collyrium extend to the globe of the eye through the eye-lids, which are frequently very much thickened and swelled? Hurtful, because the wet compresses soon become warm, and warm moist applications do harm to several kinds of ophthalmia. Whenever the compress becomes dry, it is rendered hard and stiff, and in this state it irritates and disturbs the eye. The best plan is to insinuate a few drops of the collyrium into the inner angle of the eye, while the patient lies upon his back. Thus, the application not only comes into contact with the parts on which it is to act, for it spreads over the whole eye-ball towards the external angle, especially when the patient moves the eye-lids, and turns his head sideways, but it also continues a certain time upon the affected parts, if the patient be kept upon his back, and a few fresh drops be every now and then introduced.

Particular cases occur, in which the inflamed eyes are benefited by no wet topical applications. Such deviations from what is common cannot always be discovered *à priori*. A short trial soon evinces the powerful effect of this description of local remedies, and the necessity of abstaining from them. All external applications must now be left off, or only such as are dry employed. Richter mentions a mixture of camphor, elder flowers, and chamomile, in little bags, as being an useful remedy in these peculiar examples.

Most of the external applications employed in cases of ophthalmia, admit of being divided into two kinds, discutients, astringents, and soothing emollients. Acute ophthalmies in the incipient stage, while bleeding has not been sufficiently practised, and the eyes are yet very painful, will not bear the first class of remedies, which, acting as stimulants, would increase the pain and inflammation. But, in proportion as the pain subsides, and the necessity for bleeding diminishes, and as the inflammation assumes a chronic nature, such applications become more useful. The more painful and acute the ophthalmia is, the more proper are the topical remedies of the second class. Certain ophthalmies, also, which are not very violent and acute, but which are attended with considerable sensibility in the eyes, require the use of soothing applications. On the other hand, the greater the degree of redness and swelling in the inflamed eye, provided the pain be moderate, the more strongly are tonics and astringents indicated. Ophthalmies, accompanied with a copious discharge of acrid tears, are most benefited by emollient allaying remedies. Sometimes inflamed eyes appear to derive no good from any kind of external applications whatsoever.

As Richter observes, there are cases in which the surgeon foresees the disorder, and by timely prophylactic measures has it in his power to prevent, or, at all events, lessen it. Such instances particularly occur in surgical operations upon the eyes. Here inflammation is always to be expected, and
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it not unfrequently proves a cause of the ill success of the operation. The sole design of all preparatory treatment adopted before the latter proceeding, is to lessen and prevent the apprehended inflammation. With this view, it was once the custom to keep the patient a certain time on a low debilitating diet; to hinder him from taking the air, to exhibit weakening aperient neutral salts, and even to have recourse to venesection. By such means, the irritability of the patient was increased, and, of course, the ensuing inflammation, and all its bad effects, were aggravated. Besides, the long formal preparation tended to increase the alarm which the patient generally felt before the operation was undertaken; while persisting in the exhibition of aperient salts checked the secretion from the skin, weakened the stomach and bowels, and disposed the patient to gastric complaints, which were sure to have an unfavourable effect upon the consequences of the operation. Repeated experience proves, says Richter, that operations on the eyes are performed with most success upon patients who are strong, hardy, healthy, and little irritable, and who have not submitted to any of the above preparatory treatment. The only things which can be of use before the operation consist in endeavouring to quiet the patient's apprehensions, by representing what is about to be done as safe, and by no means very painful; in not keeping the patient a long while in fearful expectation of the operation; in letting the patient take exercise in the open air; in giving him antimonials in order to promote perspiration, by which means the risk of inflammation will be materially lessened; and lastly, in administering an opiate, half an hour before the operation, when the patient seems restless. These directions, however, are only applicable to cases in which the patient is, in other respects, quite healthy; for it is essentially necessary to obviate any other diseases, or defects, which may prevent the success of the operation. (See Richter's *Anfangsgr.* band iii. kap. 1.) From these general observations we shall next proceed to the consideration of each particular species of ophthalmia.

Of the mild acute Ophthalmia.—This form of the complaint is characterised by redness of the conjunctiva and lining of the eye-lids, an unnatural sensation of heat in the eyes, uneasiness, itching and shooting pains, as if particles of sand had got between the palpebræ and the eye-ball. At the place where the pain seems to be most severe, there are some blood-vessels which appear more turgid and prominent than other vessels of the same class. The patient of his own accord keeps his eye-lids closed; for he feels a weariness and restraint in opening them, and, by shutting them, he also moderates the action of the light, to which he cannot expose himself, without increasing the burning sensation, lancinating pain, and effusion of tears from the eye. If the constitution is irritable, the pulse will be a little accelerated, particularly towards the evening; the skin will be dry, slight shiverings will occur, and, in some instances, nausea and inclination to vomit. See Scarpa's *Osservazioni sulle Principali Malattie degli Occhi.* cap. 7.

This complaint is often the consequence of a cold, in which the eyes, as well as the pituitary cavities, fauces, and trachea, are affected. It is not unfrequently occasioned by change of weather, sudden transitions from heat to cold, the prevalence of easterly winds, journeys through damp unhealthy sandy countries in the hot season of the year, exposure of the eyes to the vivid rays of the sun, &c. Hence, as Scarpa has judiciously remarked, it does not seem extraordinary that it should often make its appearance as an epidemic, and afflict persons of every age and sex. Besides the preceding remote causes of ophthalmia, authors have enumerated, as others, the suppression of some habitual eva-

cuation, such as bleedings from the nose, or piles, stoppage of the menses, &c. Also affections of the primæ viæ, worms, dentition, &c.

The mild acute ophthalmia may, in general, be easily cured by means of low diet, gentle purging with small repeated doses of the antimonium tartarizatum, and after making search for any extraneous body that may have insinuated itself beneath the eye-lids, repeatedly washing the eye with a warm decoction of mallow leaves, and covering it with any very soft emollient poultice, which should be included in small bags of fine muslin. Scarpa thinks the fluid remedy may be most conveniently applied by means of an eye-glass. He orders the antimonium tartarizatum to be taken as follows: *R* Antim. tart. gr. j. Decocti hordei libiss crystal. Tart. 3i. Sacchari purif. 3vj. Misce. This quantity is to be taken in divided doses, every day. Scarpa, instead of the barley water, prescribes the decoction of dog-grass, which does not appear to us to be essential.

Under this treatment, the inflammatory stage of the mild acute ophthalmia commonly ceases in the course of four or five days. The patient no longer complains of that oppressive sense of heat, tension, throbbing, &c. previously experienced, and he can now bear a moderate light, without so profuse a discharge of tears, as used previously to be the consequence. In this state, how red soever the tunica conjunctiva may appear, it is no longer affected with acute inflammation, and the ophthalmia has relapsed from its acute stage into that attended with relaxation and weakness of the vessels of the conjunctiva and membranous lining of the eye-lids. Emollients are now improper; in lieu of them, astringent corroborant collyria should be used, by means of which the relaxed vessels of the conjunctiva and eye-lids will recover their original tone, and the ophthalmia be totally removed. One of the following eye-waters, which are similar in quality to those directed by professor Scarpa, may be employed. *R* Zinci sulphatis gr. v. Aquæ rosæ 3iv misce. Vel plumbi superacetatis gr. viij. Aquæ fœniculi 3vj. Spir. camphorati ʒi x misce. The mild ophthalmia, originating from causes which render it an epidemic, so quickly passes through the first inflammatory stage, that this stage is scarcely observable, and, according to Scarpa, it is the only case in which cold astringent applications are immediately necessary.

Of the severe acute Ophthalmia.—The severe acute ophthalmia is attended with the same description of symptoms as the mild, but in a more aggravated form. The sensation of heat in the eyes is burning; the constriction of the whole eye-ball and eye-lids spasmodic; the presence of even a faint light intolerable. Sometimes the effusion of tears is continual, very copious, and blended with mucus, which is apt to make the eye-lids adhere together. Sometimes this secretion is almost suppressed, and the eyes become preternaturally dry. The sympathetic fever is considerable, with restlessness and intolerable pain about the back part of the head. The pupil is contracted; the conjunctiva of an uniformly deep red colour. On the anterior hemisphere of the eye, amongst the most prominent fasciculi of vessels, may be distinguished a delicate vascular network, continued from one fasciculus to another; but all being equally turgid with blood, and coiled as it were together, seem to form a kind of excrescence, which rises above the surface of the eye, and has a tendency to project forwards beyond the eye-lids.

From the immoderate action of the inflamed vessels, blood is occasionally extravasated into the cellular substance, connecting the tunica conjunctiva with the sclerótica. Hence the first of these membranes, which is naturally loose, becomes enormously extended, and elevated in front of the eye,

eye, so as to make the transparent cornea seem quite sunk, and prevent the eye from being completely shut. *Chemosis* is the term usually applied to this sort of case.

The severe acute ophthalmia generally affects only the outer part of the eye-ball; but sometimes the interior of the eye is alone affected, or, at all events, more so than the exterior. There is little change in the external parts, the patient suffers extreme pain on exposing his eye to the faintest light; the iris has a red appearance; the pupil is exceedingly contracted; and the aqueous humour is occasionally red and turbid. From these circumstances, Scarpa thinks it not irrational to suspect, that in the highest degree of internal ophthalmia, there may be an extravasation of blood in the chambers of the eye, especially betwixt the choroid and sclerotic coats. Hence may arise the termination of the internal ophthalmia in amaurosis, so common when the case does not end in suppuration.

The severe acute ophthalmia demands the most rigorous adoption of the antiphlogistic treatment. Tardiness in procuring evacuations, especially of blood, too often gives the disease time to advance to the state of chemosis; or else to a condition in which suppuration, or an extravasation of lymph within the eye, is threatened; while, in other instances, the inflammation degenerates into an obstinate chronic ophthalmia, arising from the excessive weakness produced in the vessels of the conjunctiva. Both general and topical blood-letting should therefore be speedily practised. Leeches should be applied to the vicinity of the eye-lids, especially, says Scarpa, about the inner canthus, on the vena angularis, where it joins the frontal, deep orbital, and transverse vein of the face. See *Saggio di Osservaz. &c. cap. 7.*

Mr. Ware objects to leeches being put on, or very near the eye-lids, as they have sometimes caused a considerable swelling of those parts, and increased instead of lessening the irritation. In ordinary cases, this gentleman recommends applying three in the hollow of the temple, about an inch and a half from the outer part of the orbit. There is one mode of bleeding, in cases of ophthalmia, perhaps productive of more benefit than any other, and this probably on account of its acting at once both as a general and topical application; the plan alluded to is that of opening the temporal artery.

There is another method of bleeding, which deserves to be particularly noticed, as having frequently proved superiorly efficacious. The visible blood-vessels on that part of the conjunctiva, which covers the inside of the eye-lids, are much more numerous than those which are observable on the white of the eye. Hence, in ophthalmia, the inflammation seems greatest on the inside of the eye-lids, where the blood-vessels are often not only much increased in number, but are also extremely full and turgid. Sometimes also the whole inside of the eye-lids, particularly of the lower one, is so much enlarged as to be constantly turned outward. In both these cases great benefit has been derived from scarifying the inner surface of these parts with a lancet, by which means a considerable quantity of blood has been removed. When the upper eye-lid is very cedematous in ophthalmia, and its thickness prevents the application of remedies to the eye, a few punctures made in the outside of the swelled part, near its edge, will let out a quantity of bloody water, and materially lessen the swelling. When the tumefaction of the everted eye-lids is very considerable, great and speedy relief has often been given, by cutting off a piece of the inside of those parts with a pair of curved scissors. Ware on Ophthalmia, p. 39, 40.

General bleeding, though copious, and assisted by the topical application of leeches, does not always prove ade-

quate to the removal of the high degree of inflammation attendant on chemosis. It is expedient to employ additional means, in order to give exit to the blood effused in the cellular substance, between the conjunctiva and sclerotic, and raising the first of these membranes so much above the level of the cornea. With this view Scarpa recommends making a circular incision in the conjunctiva near the margin of the cornea, with a pair of curved scissors. As a lancet, however, makes a cleaner cut, it is perhaps preferable for the operation, and scarifications might suffice both for the discharge of the extravasated blood, and of that distending the vessels of the conjunctiva itself. But, according to Mr. Ware, there cannot be an easier, nor a more effectual remedy in chemosis, than æther. A few drops are to be poured into the palm of the hand, and diffused over it, which may be immediately done by pressing the other hand against it. The hand is then to be applied to the eye, and kept so close to it that the spirit, as it evaporates, may insinuate itself into the part affected, and bring about the absorption of the extravasated blood. In a few instances of chemosis, in which the swelling and inflammation have been considerable, Mr. Ware has found the following application of singular service: *R. Interiorum foliorum recentium lactucæ fistilis ʒij. Coque cum aquæ puræ ʒfs in balneo mariæ pro semihorâ; tunc exprimitur succus, et applicetur paululum ad oculos et ad palpebras sæpe in die.*

After general and topical bleeding, aperient medicines of the most gentle kind should be administered; soda phosphorata, pulp of tamarinds, potassæ supertartaras, and magnesiæ sulphas, are the most proper. When the stomach is affected, Scarpa also recommends an emetic, as being of singular service in cases of ophthalmia.

When bleeding and other evacuations have been practised, the next most useful measure is the application of a blister to the nape of the neck. Scarpa observes that the integuments in this situation, and behind the ears, sympathize more closely with the eyes than any other part of the skin does. Many practitioners, however, and among them Mr. Ware, prefer blistering the temples. The latter says, "when the leeches have fallen off, and the consequent hemorrhage has ceased, I would advise a blister, of the size of half-a-crown, to be applied to the temples, directly over the orifices made by the leeches; and I have found that the sooner the blister has followed the bleeding, the more efficacious both have proved." When the ophthalmia has been very violent, and resisted the common method, Mr. Ware adds, that the most beneficial effects have also been sometimes produced by the application of a blister large enough to cover the whole head. P. 43, 44.

At first, topical emollient applications to the eye are most beneficial; such as mallows boiled in new milk, bread and milk poultices, or the soft pulp of a baked apple; all included in fine little muslin bags. Remedies of this description should be renewed at least every two hours. The patient should be directed to observe perfect quietude, and to lie with his head in an elevated position. To keep the eye-lids from adhering together in the night time, the spermaceti cerate is proper. When the ophthalmia is accompanied with a violent pain in the head, Mr. Ware recommends a strong decoction of poppy heads to be applied as a fomentation. P. 51.

Under the preceding plan of treatment, the acute stage of severe ophthalmia usually abates in the course of a week. The burning heat, and darting pains in the eyes, and the febrile disturbance of the constitution, all subside. The patient is comparatively easy, and regains his appetite. The eye-lids lose their tension and wrinkle. A discharge of thick

matter

matter takes the place of a secretion of thin serum, or of a preternatural dry state of the eyes. These organs can now be opened, without experiencing vast irritation from a moderate light. In this state, notwithstanding the eyes may continue red, and the conjunctiva swollen, all evacuations are to be left off, as well as the use of topical emollients. For these latter, astrigent corroborant collyria are to be substituted. Scarpa recommends the following application: *R. Zinci sulphatis gr. vj. Aq. distillatæ ʒvj. Mucil. fem. cydon. mali ʒj. Spirit. camphor. guttas paucas. Misce et cola.* This collyrium may be injected with a syringe, between the eye and eye-lids, once every two hours; or, if the practitioner prefer the method, the eye may be bathed in the lotion by means of an eye-cup. Such persons as cannot bear cold applications to the eye, must have the same kind of collyrium a little warmed; but it may be used cold, as soon as the irritability begins to decrease.

The tinctura thebaica of the old London Dispensatory proves a most efficacious remedy for the second stage of acute ophthalmy, or that connected with weak vascular action in the part affected. Two or three drops may be introduced, between the eye-lids and globe of the eye, twice a day in common cases; but in others, attended with more sensibility, once will at first be sufficient. Mr. Ware, who brought this application into repute, has found, that introducing two or three drops of this medicine at the inner canthus, and making them glide gradually over the eye, by gently drawing down the lower eye-lid, proves equally beneficial, and less painful, than dropping them at once on the eye-ball. Immediately the application is made, it generally creates a copious flow of tears, a smarting pain, and a sense of heat in the eyes, which inconveniences, however, soon cease, and the eyes become clearer, and feel evidently improved. It should be well understood, that the tinctura thebaica may be used too extensively; and that it is only proper for cases, in which the acute stage of the disorder has been previously lessened by blood-letting, aperient medicines, and blisters. Scarpa has expressly pointed out, that it is a remedy, which is useful only when the violence of the pain and the inability to bear the light are abated.

Whenever the patient can easily bear a moderate degree of light, all coverings should be removed from the eyes, except a shade of green or black silk. A brighter light should be gradually admitted every day into his chamber; so that he may become habituated as soon as possible to the open day-light. Nothing, says the judicious Scarpa, has a greater tendency to keep up and increase the morbid irritability of the eyes, than keeping them unnecessarily long in a dark situation, or covered with compresses and bandages.

Purulent Ophthalmy of Children.—This species of ophthalmy produces such a swelling of the eye-lids, as almost entirely prevents their separation from each other. Should the surgeon obtain a view of the membrane lining them, it will be found to be wrinkled, and converted into a red villous surface, somewhat like the inner coat of the rectum, when protruded in young children. (Warner on the Human Eye, p. 42.) Sometimes in the child's fits of crying the eye-lids become everted, and continue so, until rectified by an attendant. No sooner is the first short attack of inflammation past, than a discharge of thick yellow matter ensues, truly surprising in quantity, partly secreted by the Meibomian glands, but chiefly by that villous, fungus-like surface, into which the lining of the palpebræ seems converted. If the eye-lids admit of being opened, the matter may be seen diffused over the whole surface of the eye; and its confinement under the swelled eye-lids and the eye-ball contri-

butes still more to aggravate the pain, increase the inflammation, and often induce ulcers, or specks, either over a part or the whole of the cornea. If a speedy check be not soon put to this distressing malady, it frequently renders the cornea so opaque and thickened, as to form what is termed *staphyloma*. (See this word.) The cornea has even been known to burst, the humours to be discharged, and the eye to sink in the orbit. The febrile symptoms are at first severe; the infant is continually fretful and restless, and a diarrhœa is not unfrequently concomitant. The affection of the eyes is occasionally accompanied with eruptions on the head, and with marks of a scrofulous constitution. Ware, p. 138. &c.

The antiphlogistic treatment should be quickly opposed to the progress of the disease. The temporal arteries should be opened, or leeches applied to the temples, or neighbourhood of the eye-lids, and a blister put on the nape of the neck or temples. The child should be kept in a cool room, and not covered with much clothes. If no diarrhœa should prevail, it is proper to purge with a little rhubarb, or magnesia, in syrup of violets.

A surgeon is seldom called in before the first short inflammatory stage has ceased, and an immense discharge of matter from the eyes has commenced. Of course, emollient applications are generally improper. Astringents and corroborants are immediately indicated, in order to restore to the vessels of the conjunctiva and eye-lids their original tone, to rectify the villous and fungous appearance of the lining of the palpebræ, and thus finally to check the morbid secretion of matter. For this purpose, Mr. Ware strongly recommends the aqua camphorata of Bates's Dispensatory: *R. Cupri vitriolati. Bol. Armen. āā ʒiv. Camphoræ ʒj. M. & f. pulvis, de quo projice ʒj. in aquæ bullientis Ibiv. amove ab igne, et subdant facies.* Mr. Ware, in his late Remarks on Purulent Ophthalmy, 1808, observes, that he usually directs the aqua camphorata, as follows: *R. Cupri vitriolati. Bol. Armen. āā gr. viij. Camphoræ gr. ij. Misce, et affunde aquæ bullientis ʒviij. Cum lotio sit frigida, effundatur limpidus liquor, et sæpissimè injiciatur paululum inter oculum et palpebras.* This remedy possesses a very styptic quality; but it is much too strong for use, before it is diluted; and the degree of its dilution must always be determined by the peculiar circumstance of each case. Mr. Ware ventures to recommend about one dram of it to be mixed with an ounce of cold clear water, as a medium or standard, to be strengthened or weakened as occasion may require. (P. 143.) The remedy must be applied by means of a small ivory or pewter syringe, the end of which is a blunt-pointed cone. The extremity of this instrument is to be placed between the edges of the eye-lids, in such a manner, that the medicated liquor may be carried over the whole surface of the eye. Thus the matter will be entirely washed away, and enough of the styptic medicine left behind to interrupt and diminish the excessive discharge. According to the quantity of matter, and the rapidity with which it is secreted, the strength of the application, and the frequency of repeating it, must be regulated. In mild recent cases the lotion may be used once or twice a-day, and rather weaker than the above proportions; but in inveterate cases, it is necessary to apply it once or twice every hour, and to increase its styptic power in proportion; and when the complaint is somewhat relieved, the strength of the lotion may be lessened, and its application be less frequent.

“The reasons for a frequent repetition of the means just mentioned, in bad cases, are, indeed, of the most urgent nature. Until the conjunctiva is somewhat thinned, and the quantity of the discharge diminished, it is impossible to

know in what state the eye is; whether it is more or less injured, totally lost or capable of any relief. The continuance or extinction of the sight frequently depends on the space of a few hours: nor can we be relieved from the greatest uncertainty, in these respects, until the cornea becomes visible." Ware, p. 145.

This gentleman, with every appearance of reason, condemns the use of emollient poultices, which must have a tendency to increase the swelling and relaxation of the conjunctiva. If poultices are preferred, he particularly recommends such as possess a tonic or mild astringent property; as one made of the curds of milk, turned with alum, and an equal part of unguentum sambuci, or axungia porcini. This is to be put on cold, and frequently renewed, without omitting the use of the injection. Ware, p. 147.

When the secreted matter is glutinous, and makes the eye-lids so adherent together, that they cannot be opened, after being shut for any length of time, the adhesive matter must be softened with a little fresh butter mixed with warm milk, or by means of any other soft oleaginous liquor, after the poultice is taken off, and before using the lotion. P. 147.

If the eversion of the eye-lids only occurs when the child cries, and then goes off, nothing need be done in addition to the above means. When, however, the eversion is constant, the injection must be repeated more frequently than in other cases; the eye-lids put in their natural position after its use; and an attendant directed to hold on them, with his finger, for some length of time, a compress dipped in the diluted aqua camphorata. P. 148.

In some cases, when the inside of the eye-lids has been very much inflamed, the tinctura thebaica, insinuated between the eye and eye-lids, has been useful. If, after the morbid secretion is checked, any part of the cornea should be opaque, the unguentum hydrargyri nitrati, melted in a spoon, and applied accurately on the speck, with a fine hair pencil; or Janin's ophthalmic ointment, lowered and used in the same manner; may produce a cure, if the opacity be not of too deep a kind. When the local disease seems to be kept up by a bad habit, alteratives should be exhibited, such as the æthiops mineralis, or small doses of calomel.

Purulent Ophthalmia in adult Subjects.—There is another kind of purulent ophthalmia to which adults are subject, and which is so generally represented by the best modern authors, as arising from two very peculiar causes, viz. the suppression of a gonorrhœa, and the inadvertent application of the matter of gonorrhœa to the eyes, that we feel it to be our duty not to pass over the case in silence.

The disease produces rather a swelling of the conjunctiva, than of the eye-lids. This tumefaction is quickly followed by a discharge of a yellow greenish matter, similar to what issues from the urethra in cases of clap. Heat and pain in the eyes, great aversion to light, and, in some instances, an appearance of hypopium in the anterior chamber, are symptoms which accompany the complaint. When the disorder proceeds from the application of the infectious matter to the eyes, it is alleged to be of a less severe kind.

With respect to the case, asserted to originate from a suppression of a discharge from the urethra, the method commonly adopted by such practitioners as place implicit reliance in the assigned cause, is to inject into the urethra warm oil, introduce bougies, and apply poultices to the perineum, with a view of renewing the discharge from the passage. However, the rarity of the complaint, upon the sudden stoppage of a gonorrhœa; the possibility of an ophthalmia arising as well at this, as at any other period, quite

independently of the urethral affection; and the fallacious nature of any inference deduced from the supposed resemblance of the discharge from the eyes to that from the urethra, are circumstances which cannot fail to raise in a discerning mind a degree of doubt concerning the reality of the imputed cause. Cooper's First Lines of Surgery, p. 316. edit. iii.

The treatment of the purulent ophthalmia in adult subjects, from what cause soever it may arise, consists in adopting at first antiphlogistic means, applying emollient remedies to the eyes, and a blister to the temple, or nape of the neck. The eyes may be frequently fomented with a decoction of white poppy-heads, and warm milk may be repeatedly injected beneath the eye-lids. In order to prevent the eye-lids from adhering together, the spermaceti cerate may be smeared upon the edge of each tarsus every night at bed-time.

When the heat and pain in the eyes, and the febrile symptoms are diminished; when an abundant discharge of pus has commenced; all topical emollient applications are to be relinquished, and the following collyrium made use of: *R. Aq. rosæ ʒx. Hydrarg. oxymuriatis gr. j. Misce.* Scarpa affirms, that in the ophthalmia originating from the inadvertent communication of gonorrhœal matter to the eyes, applications in the form of ointment, such as Janin's ung. ophthalmicum, or the ung. hydrarg. nitrati, are more efficacious than fluid remedies.

Of the epidemic purulent, or Egyptian Ophthalmia.—The species of ophthalmia about which we shall next offer a few observations, has received the last of the above appellations, in consequence of its having been supposed to resemble that kind of inflammation of the eyes, which destroyed the sight of a considerable number of our soldiers in Egypt in the year 1801, or rather in consequence of the opinion, that it is a peculiar ophthalmia, which was first brought from that country into England by the troops which returned from the celebrated Egyptian expedition. Mr. Ware, however, does not approve of calling this ophthalmia *Egyptian*, because, says he, an ophthalmia, precisely similar in its symptoms and progress, has appeared long ago in this and other countries, and in Egypt, as well as England, several varieties of ophthalmia prevail. This gentleman prefers naming the epidemic inflammation of the eyes *purulent*, since one of its chief symptoms, and that which distinguishes it from every other, is the profuse discharge of a purulent-coloured fluid. This case is very different from an ophthalmia, which, at various times, has been epidemic in this and other countries, without any purulent discharge from the eyes, which is seldom dangerous to sight, and in a few days generally yields to internal antiphlogistic means, and mildly astringent applications. Ware on the Epidemical Purulent Ophthalmia, note p. 3. 1808.

Few surgeons have seen more of this distressing disease than Mr. George Peach, surgeon to the 9th regiment of light dragoons, and formerly surgeon to the 2d battalion of the 52d regiment of foot, a corps in which the Egyptian ophthalmia prevailed in a surprising degree.

According to this gentleman, the patient complains, in the first stage of the disease, of being suddenly seized with a rolling of sand in his eye; the vessels on the albuginea become suddenly turgid with blood, and the lower palpebræ very vascular. The cases treated in this recent state generally yield. But, if very active measures do not arrest the progress of the disease, the second stage appears, when the palpebræ superiores become much enlarged; the eye-lids can only be opened with extreme difficulty, and then either a scalding fluid is discharged and excoriates the face,

or a flux of thick yellow matter takes place. In this state, it is frequently in our power to stop the progress of the evil; but if the most decided and active practice be not adopted, the disease reaches the third stage, in which every thing is seldom of little avail in relieving the most distressing symptoms. The cornea now too often becomes ulcerated, and the eye ruptured.

On the first appearance of the disease, Mr. Peach had recourse to venesection, and the antiphlogistic treatment. Being unsuccessful, he tried bark and stimulants; but being still more unsuccessful with this mode of treatment, he reverted to the antiphlogistic plan in its fullest extent, and with the greatest success, and he found, that he did not formerly succeed, because he did not carry this mode far enough. It is in the commencement of the disease that a very large quantity of blood should be taken away: in that stage, large venesection, even *ad deliquium animi*, is almost an infallible remedy. It is not sufficient to take away twenty or thirty ounces of blood. Mr. Peach has often taken away sixty, at the same time enjoining perfect rest, the avoidance of all animal food, and putting in practice every other part of the antiphlogistic treatment. The complaint is naturally disposed to relapse, and as often as the disease, or even the slightest pain, or uneasiness in the eye, returns, so often did this gentleman return to the lancet. Such practice, Mr. Peach confesses, is likely to excite astonishment; but the fullest trial of it has demonstrated to him its utility. In many of the cases, which occurred to him, the progress of the inflammation was so rapid, that it probably would have totally destroyed the eye, if only the ordinary mode of treating ophthalmia had been resorted to. He advises particular attention to be paid to the first sensation of sand in the eye: he never defers venesection, when this is complained of; and the patient, in general, finds so much advantage during the operation, that he says, "the sand is removed." Mr. Peach has occasionally found advantage arise from dropping the undiluted aqua litharg. acetat. into the eye, though great pain was the immediate effect of its application. On the whole, however, he concludes, that dropping substances into the eye is not serviceable, and says, that, since this practice was relinquished, the eye-lids have not been so often inverted. The bowels must be kept open. Benefit has often been derived from shaving the head, and keeping it continually wet with water, or vinegar. Blisters are also sometimes indicated; but the great reliance is to be put in the strictest antiphlogistic regimen, and copious venesection. See Edinb. Med. and Sur. Journal, for January, 1807.

With regard to the causes of the epidemic purulent ophthalmia, Mr. Ware seems to think, that the complaint is mostly communicated by contact. Some of the worst cases of the purulent ophthalmia of children have happened in those, whose mothers were subject to an acrimonious discharge from the vagina at the time of parturition. Some of the worst forms of the purulent ophthalmia in adults have occurred in those, who, either shortly before the attack of the ophthalmia, or, at that very time, laboured either under a gonorrhœa, or a gleet. Mr. Ware does not mean to impute every purulent ophthalmia to such a cause; but in the majority of adults whom he has seen affected, if the disorder had not been produced by the application of morbid matter from a diseased eye, it could be traced to a connection between the ophthalmia and disease of the urethra. Other causes, Mr. Ware acknowledges, may contribute to aggravate, and, perhaps, produce the disorder, and the purulent ophthalmia in Egypt has been attributed to a great number. The combined influence of heat and

light, of a burning dust continually raised by the wind, and of the heavy dews of the night, may powerfully tend to excite inflammations of the eyes. Yet something more must operate in causing the malignant ophthalmia now under consideration; for the same causes operate with equal violence in some other countries besides Egypt, and yet do not produce the same effect; and in this country, (continues Mr. Ware,) the disorder prevailed during the last summer, to as great a degree, and upon as great a number of persons, within a small district of less than a mile, as it ever did in Egypt; and yet, beyond this space, on either side, scarcely a person was affected with it. The disorder was certainly brought into this country by the soldiers who returned from Egypt, and was probably communicated from them to many others. Now, as the action of the atmosphere alone cannot account for the spreading of the disease, &c. Mr. Ware is led to believe, that this particular disorder is only communicable by absolute contact; that is, by the application of some part of the discharge, which issues, either from the conjunctiva of an affected eye, or from some other membrane secreting a similar poison, to the conjunctiva of the eye of another person. In schools and nurseries, in consequence of children using the same basins and towels, as others who had the complaint, the disease has been communicated to nearly twenty in one academy. Hence, Mr. Ware censures the indiscriminate use of those articles in schools, nurseries, hospitals, ships, and barracks. P. 14, 15.

The principal difference, between the purulent ophthalmia of infants, and that of adults, consists in the different states of the tunica conjunctiva. In the former, notwithstanding the quantity of matter confined within the lids is often profuse, the inflammation of the conjunctiva is rarely considerable, and whenever the cornea becomes impaired, it is rather owing to the lodgment of such matter on it, than to inflammation. But in the purulent ophthalmia of adults, the discharge is always accompanied with a violent inflammation, and generally with a tumefaction of the conjunctiva, by which its membranous appearance is destroyed, and the cornea is made to seem sunk in the eye-ball. Ware, p. 23.

We have already detailed the successful plan of taking very large quantities of blood from the arm, as practised by Mr. Peach. Mr. Ware speaks also in favour of bleeding; but has rarely carried it to the extent it has been in the army. In weak persons, this gentleman prefers, instead of repeating venesection, topical bleeding, either from the vein that passes on the side of the nose, or by means of five or six leeches put on the temple. Sometimes, he thinks it better to scarify the inside of the lower eye-lid with the point of a lancet, carried along parallel to, and very near the margin of this part. Mr. Ware objects to pricking the eye-lid in an infinite number of places, as very painful, and likely to increase the irritation. The lancet never need be applied more than twice, and rarely more than once; and, perhaps, less pain will be occasioned by making the incision with the edge, rather than the point of the lancet. After taking away blood, Mr. Ware says, a large blister on the head, or back, is often useful. Anodynes should be given, with occasional purgatives, and an antiphlogistic regimen. Ware on Purulent Ophthalmia, 1808, p. 26, &c.

Dr. Vetch, on the subject of local applications in the present disease, advises keeping the eyes continually covered with linen, dipt in some cooling lotion. In the first stage, he gives the preference to dropping the aqua sapphirina into the eye; afterwards, when the swelling of the eye-lids has come on, he prefers the aqua litharg. acet. While the patient is subject to a recurrence of pain, he thinks the

injection of warm water the best application. For the purpose of lessening the swelling of the eye-lids, he advises compresses, dipt in the aqua litharg. acet., to be applied with a moderately firm pressure. When the swelling, and other symptoms of the second stage have subsided, Dr. Vetch recommends more astringent applications, such as the aqua lithargyri acet., Bates's camphorated water, solutions of alum, and the muriate of mercury. See *An Account of the Ophthalmia*, as it appeared in England since the Return of the British Army from Egypt; by John Vetch, M.D. 1807; p. 111.

Mr. Ware gives the preference to the aqua camphorata, which is to be used exactly in the same way, as was described above, in speaking of the purulent ophthalmia of children. Probably, if army surgeons had been careful to inject their applications under the eye-lids, as advised by Mr. Ware, great benefit would have been produced. In other ways, the effect of the remedies is often lost. When the inflammation has been great, Mr. Ware has only put four or five grains, instead of eight, of the cuprum vitriolatum to eight ounces of water; and, while the inflammation is great, he would never advise more than eight grains to this quantity of water. He usually employs the lotion cold, especially in children; but in some adults, in whom the general fever and local inflammation have been considerable, he has been obliged to use it warmed. In cases of great pain and swelling, it should be very weak, less often applied, and sometimes only warm water injected. In such circumstances, Mr. Ware also sanctions fomenting the eye with a flannel, or sponge, wet with a hot decoction of poppy-heads, or mere hot water. When the cornea threatens to burst, this gentleman approves of opening it, in order to discharge the aqueous humour, by making an incision in a place where the scar will not obstruct vision.

Mr. Wardrop, it is well known, has advised puncturing the cornea, and letting out the aqueous humour, in all cases of ophthalmia attended with severe symptoms and considerable fullness of the eye. (See *Edinb. Med. and Surg. Journal*, for January 1807.) Mr. Ware approves of the same proceeding in the epidemic purulent or Egyptian ophthalmia, when antiphlogistic, mucous, and astringent lotions fail in lessening the symptoms, and in preventing the cornea from becoming opaque; but, especially, if a white rim should begin to be formed at its circumference.

Of Chronic Ophthalmia.—Strictly speaking, every acute ophthalmia has a second stage, which is, when compared with the first, of a chronic nature. However, in general, when *chronic* ophthalmia is spoken of, the disease is implied, as it appears in a very protracted state.

The ordinary causes of chronic ophthalmia are of three kinds. 1. An increased irritability continuing in the eye after the acute stage of ophthalmia has subsided. 2. Another affection of the eye, or of the adjoining parts, of which the chronic ophthalmia is only an effect. 3. Constitutional disease.

1. The first kind of case requires the internal exhibition of bark and valerian. The patient should take nourishing, easily digestible food; a moderate quantity of wine and gentle exercise; and he should reside in a mild and salubrious situation. The vapour of the spiritus ammoniæ composuit should be applied to the eye, through a funnel for half an hour, three or four times a day, and the eye-lids and eye-brows may be rubbed with the linimentum camphoræ.

2. The disorders in the eye and its vicinity, on which chronic ophthalmia depends as an effect, are considered in other articles of the present work. See *FISTULA Lachrymalis*; *STAPHYLOMA*; *TRICHIASIS*; *ECTROPIUM*; &c.

We shall conclude this subject with a few observations on chronic ophthalmia connected with constitutional diseases.

Scrofulous Ophthalmia.—According to the posthumous work of Mr. Saunders, pustules of the conjunctiva, aggregated at the margin of the cornea, or appearing separately, or successively over any part of its surface, constitute a specific character of strumous ophthalmia, with which the morbid appearances, peculiar to a scrofulous constitution, are in various degrees connected. In large cities, the causes are stated to be an impure atmosphere, improper food, and cold.

No specific for scrofula being known, the treatment rather consists in preventing an aggravation, than attempting the radical cure of the complaint. Every thing debilitating is injurious; as evacuations, indigestible food, intense study, a sedentary life, damp marshy residences, lowness of spirits, frequent transitions from heat to cold. On the other hand, keeping the bowels in a regular state with small doses of the tartras potassæ, antimonium tartarizatum, or rhubarb, and the exhibition of bark, to which may be occasionally added the tinctura guaiaci ammoniata, are particularly proper. The æthiops mineralis may be advantageously given from gr. ss to gr. xx daily for the space of three weeks. Scarpa also recommends the aqua calcis to be taken in broth for several months, and sea-bathing, and friction of the body with a flesh-brush.

With regard to topical remedies, soft relaxing applications prove hurtful; but slightly astringent collyria, the tinctura thebaica, and the unguentum tutiæ, are advantageous applications. All coverings must be removed from the eyes, except a shade of green silk.

Scrofula often disappears spontaneously as children approach the adult state, and, with it, this affection of the eyes.

Upon the treatment of scrofulous ophthalmia, the publication of the late Mr. Saunders affords no very remarkable information. Mild cases are said to yield to a purer atmosphere, and a few doses of the hydrargri submuriæ and rhubarb; but too frequent a repetition of the first of these medicines is condemned. When the inflammation is not acute, and the ulcers are indisposed to heal, we are advised to inject on them a solution of nitrate of silver, two grains to an ounce of distilled water. But when more lymph is effused round the ulcer than is necessary for the healing process, general, or topical bleeding, and more frequent purging, are sanctioned. In this state, every stimulant application is forbidden, and we are recommended to employ either a weak saturnine lotion cold, or else a warm decoction of poppies.

Venereal Ophthalmia.—In no subject do surgical writers betray less consistency than in the present. Many have doubted the reality of syphilitic ophthalmia; others have admitted its occurrence, but left it undescribed. Scarpa says it is peculiar in not betraying manifest signs of inflammation, stealing on clandestinely without much uneasiness. It afterwards relaxes the vessels of the conjunctiva and lining of the eye-lids, and alters the secretion of Meibomius's glands. Ulceration of the margin of the eye-lids is caused, the eyelashes fall off, and the cornea becomes opaque. In the worst stage, the malady excites an itching in the eyes, that is exasperated at night, and diminishes towards the morning.

It is observed by Mr. Pearson, that, in that form of the secondary symptoms of syphilis, where the skin is the part chiefly affected, a disease resembling the ophthalmia tarsi sometimes makes its appearance. It is not commonly attended with much redness of the tunica conjunctiva; nor is the sensibility of the eye to light remarkably increased; yet

this gentleman has seen the complaint, in a few instances, under the form of an acute ophthalmia, resisting all the common modes of treatment, but yielding immediately to a course of mercury.

According to Mr. Pearson, the venereal ophthalmia resembles in its appearance such diseases of the tarsi and conjunctiva as are derived from scrofula; and, in his belief, there are no specific characters by which diseases of the eye or eyelids, produced by the action of the venereal virus, can be distinguished from those which are excited by other causes. See *Trans. of Scarpa on Diseases of the Eyes*, by Briggs, note, p. 187.

In the posthumous work of Mr. Saunders, syphilitic inflammation of the iris is stated to differ from common inflammation of that part in the following circumstances: the iris is much more thickened and puckered, the texture appears more changed, the irritation on exposure to light is less, the pain is most intense at night, and red vessels are sooner seen in the substance of the iris. The pupil is not so much contracted as in a case of simple inflammation; and although the general appearance of disease is greater, the pain is actually less. The blindness is often total. When syphilis affects the other tunics of the eye, as well as the iris, the eye-ball is said to appear full, the patient is slightly incommoded by pressure on the organ, and the sensibility of the retina is impaired, and, in some instances, destroyed. In the worst stage, the pupil is represented as becoming irregular and dilated; while the iris and cornea are in contact, and much diminished and obscured; the sclerótica is tumid and uneven on its surface; and much head-ache prevails. Saunders's *Treatise on some practical Points relating to Diseases of the Eye*, &c. p. 64 and 67.

Mercurial friction, together with the decoct. sarsaparillæ et mezerei, are recommended. A few drops of a collyrium, containing the hydrargyrum muriaticum, are also directed to be introduced under the eye-lids every two hours. At night the eye-lids may be smeared with Janin's ointment, or the unguentum hydrargyri nitrati. Mr. Saunders appears to have cured venereal ophthalmies, by exhibiting calomel very freely. In one case he gave eight grains a day for a fortnight; and in another, two grains were ordered to be taken every five hours, with half a grain of opium. The same distinguished oculist also sometimes took blood from the temporal arteries.

The works to which we are chiefly indebted for the preceding observations, are Richter's *Anfangsgründe der Wundarzneykunst*, band 3. kap. 1. Ware on Ophthalmia, Pterophthalmia, &c. Also on the Epidemic Purulent Ophthalmia. S. Cooper's *Dictionary of Practical Surgery*, edit. 2; and First Lines of the Practice of Surgery, edit. 3. Saunders's *Treatise on some practical Points relating to Diseases of the Eye*; and Scarpa's *Osservazioni sulle Principali Malattie degli Occhi*, capo 7.

In the foregoing article, the reader may have expected a few remarks on common contusions of the eye; but the nature and treatment of these cases are so familiarly known to every body in the present flourishing condition of the art of pugilism, that we consider it almost superfluous to say any thing here upon the subject. The most successful plan of preventing and lessening the discolouration attending what is termed a *black-eye*, is to bathe the contused part, as soon after the receipt of the blow as possible, with the aqua ammoniacæ acetatis, or common vinegar. Linen may be wet with either of these applications, and kept constantly upon the bruise, care being taken to dip the rag frequently in the lotion, so that it may always be wet and cool. Besides this

common means, it will be proper in severe cases to purge the patient, and even to use leeches, and practise venesection.

OPIATE, OPIATUM, in *Medicine*, is sometimes applied to any confession or eleuthery.

In which sense it is defined an internal remedy, variously composed of powders, pulps, liquors, sugar, or honey, reduced into a soft consistence.

The opiate of Solomon was formerly a composition of great fame, so called from one Solomon, a physician, its inventor; and first published by Lawrence Joubert.

There is a particular kind of opiates, called *incarnatives*, for the teeth and gums, made of alum, sumach, lignum aloes, myrrh, mastic, &c. reduced into powder.

OPIATE is also used for any medicine given with an intention to procure sleep.

In which sense the word is of the same import with *narcotic*, *hypnotic*, *soporific*, or *pacific*.

OPIATE is more particularly used for a composition wherein opium is an ingredient. See OPIUM.

OPIE, JOHN, in *Biography*, our late professor of painting in the Royal Academy, was born in May, 1761, at St. Agnes, in Cornwall, a village about seven miles distant from the town of Truro. His father was a master carpenter, and principally engaged in supplying the mines in that neighbourhood with such constructions of timber as they required, either for working or for support.

Few men have attained to eminence by a more irregular course of study, by stronger native endowments, or by more determined industry, than Opie. He was very remarkable for the strength of his understanding, and the rapidity with which he acquired all the learning that a village school could afford him. When ten years old, he was not only able to solve several difficult problems in Euclid, but was thought capable of instructing others: and when he had scarcely reached his twelfth year, he established an evening school in St. Agnes, and taught writing and arithmetic; reckoning among his pupils some who were already twice his age.

His father was very solicitous to bring him up in his own business, and to this end bound him apprentice to himself. But the drudgery of a laborious employment was by no means suitable to one whose mind had attained some glimpses of science, and still more of art. From his tenth year he had practised drawing, and even painting, in a rude way; and took every opportunity, which his confined situation afforded, of contemplating prints and pictures; though without any system or intention of pursuing the art professionally. So ardent was he in the love of it, that he is said to have neglected his labour, when in houses where any picture caught his attention, and, in some instances, carried away so much of the works he saw in his remembrance, as to have made tolerable good imitations of them at home.

At last his father, who strenuously endeavoured to controul his inclinations, gave way to his determined perseverance.

He had already exhibited the superior endowments of his mind, and hung his father's house with portraits of his family and friends, when by accident he became acquainted with Dr. Wolcot, then residing at Truro, and since so celebrated under the title of Peter Pindar; who having himself a taste for drawing, and a strong perception of character, saw the worth of our artist, and was well fitted to afford him instruction in many requisite points.

The patron was proud of his pupil, and assisted and recommended him so effectually, that he commenced professed portrait painter, and went about to the neighbouring towns with letters of introduction to the principal families resident in them, and henceforward entirely supported himself by his own exertions.

At length, in 1781, he came to London, still under the auspices of Dr. Wolcot, whose powerful pen was not silent in his cause; and the Cornish boy, just sprung from a timine, and practising the difficult art of painting in a forcible manner, and in an original and untutored style, was the theme of wide-spread reputation. By the intervention of Mrs. Boscawen, to whom the doctor mentioned the talents of Opie, his works became the theme of fashionable conversation, and he was soon almost overwhelmed with solicitations for portraits by persons of the highest distinction; who, caught by the novelty, and struck with the force of his representations, pressed upon each other to be first in his study, and insure the exertions of his talents in their favour.

But in little less than a twelvemonth, the novelty ceasing, and those talents being more solid than showy, fitted more to gratify the sensible than please the vain, this burst of occupation ceased. It was found that the engaging graces and the enchanting smiles of the ladies were not tastefully displayed; or due dignity and consequence given to the gentleman: and a regard to truth, simple and unadorned, not being the guide to judgment with the many, Opie was left for a while, almost as if he had never been known, to scramble his way onward, as chance or the happy exercise of his powers might assist him.

But he was not a man to be overcome by such a change of circumstances, and perhaps it was fortunate for his reputation that it was experienced by him. Being gifted by nature with the most resolute industry and perseverance, he was determined not the less to merit a continuance of the success he had enjoyed; and employed the time now left upon his hands in attempts at composition of rustic subjects, and in more regular historical painting.

By the establishment of the Shakspeare Gallery in 1786, Opie was first fully made known to the public; the latent powers of his mind were there called forth, and what he wanted of academical and classical information, he compensated for, in great measure, by character, by force, and by a bold imitation of nature in individual parts. For this gallery he painted five large pictures, of which the finest was from the Winter's Tale; Leontes administering the oath to Antigonus to take charge of the child. But he produced, about the same time, a work of far more excellent quality in effect and colour, viz. the assassination of James I. of Scotland, now in the Common Council room at Guildhall; a work which, for hue and colour, challenges competition with the best, and is wrought with the greatest boldness and force.

The spirit of commerce having been successfully exerted, by employing historic art in the illustration of our great dramatic author, other speculations upon the same principle were soon entered upon: Macklin adopted the bible as the basis on which to form a gallery of pictures; and Bowyer, the English historian Hume; and both were happy to avail themselves of the talents so powerfully exhibited by Opie, who painted many pictures for each of these institutions with varied success.

Of Opie's style, the more engaging characteristics are breadth, simplicity, and force; its defects are want of grace and variety of invention; and of elegance and refinement in expression and execution. The objects of his choice were among the striking and terrible, rather than the agreeable and beautiful; and the materials he introduced were more accordant to his ideas of the picturesque than the proper. He frequently violated costume, not for want of knowledge so much as from an insatiable desire of contrast; and sometimes from convenience. His taste lay in the re-

presentation of natural objects with strong effect, he therefore made use of armour, or of draperies which he had in his study, and, like Rembrandt, adopted them as his antiques, and used them according as he felt they would best promote his immediate end. These defects are redeemed, to the well informed eye, by the absolute truth of imitation in which they are wrought, by the expression of his heads, particularly of old men, or of strongly marked characters, which are exceedingly impressive, by the energetic actions of his principal figures, by the broad and daring execution of his pencil, and by the magic force of his *chiaro-scuro*. In the latter point no artist ever excelled him. His figures project from the canvas in some of his best works; and if seen under favourable circumstances, would be absolutely illusive.

When the tide of historic commissions subsided, Opie employed himself in representing scenes of common life, as well as in portraits. Cottage visits, an old soldier at an ale-house door, fortune-tellers, and that class of materials which the Dutch and Flemish masters have recommended by high finish and convenient neatness of size, he painted upon a large scale. The reputation so justly due to his talents had now become steadily attached to him, and he had no longer to complain of the unfeeling caprice of fashion, for he enjoyed an uninterrupted source of employment, in portraiture at least, till his death, and generally disposed of the fancy pictures with which he chose to intersperse his labours. These were very numerous, for he was exceedingly industrious, and his principal delight was in the practice of his profession.

His portraits are well worthy of esteem, from the complete individuality which characterises them, without being marked with trifling peculiarities. They are calculated to gratify the sensible and judicious, who prefer a direct appeal to the understanding, over a more alluring insinuation by the medium of taste; which, while it pleases the eye, too frequently sacrifices somewhat of truth. Yet they are often gracefully as well as powerfully marked. Those who recollect the portrait of H. Tresham, R. A. (exhibited in 1806, and now in the possession of lord Cawdor,) will acknowledge the truth of this remark, while in that of Mr. Holcroft, (exhibited at the same time,) they beheld the great extent of his power in precise and positive, but determined and bold, imitation of feature and character.

Opie having been admitted an associate of the Royal Academy in 1786, and an academician in the year following, upon the dismissal of Mr. Barry from the body, aspired to the honour of being professor of painting, but resigned his pretensions in favour of Mr. Fuseli, who was chosen. When that gentleman was appointed to the station of keeper in 1805, he again advanced his claim, and was unanimously received. He had previously tried his power in literary composition, with no slight degree of success; first in the life of sir J. Reynolds, in Dr. Wolcot's edition of Pilkington's dictionary, and again in the publication of a plan for the formation of a national gallery, "tending at once to exalt the arts of his country and immortalize its glories." He afterwards, in 1804, read two lectures on painting at the Royal Institution, which were fraught with instructions, and were received with applause; though it has been observed by a judicious critic, that the style in which they were composed was "abrupt, crowded, and frequently unmethodical; rather rushing forward himself, than leading his auditors to the subject." Nevertheless, his exertions on this occasion drew upon him respect, the more perhaps as he was not generally known to be a man fond of literature; and the world were the more surprised to hear refined sentiments in easy and even elegant language, from one who was not unfrequently represented

represented as coarse and vulgar in mind and manner. In fact, Opie by no means merited such an unfavourable report; he was plain and unaffected, and spoke his mind freely; was manly and energetic, yielding little to folly or caprice, and by no means adapted to gratify the vain and ignorant; but he was not wilfully offensive, and condemned warmly those who were so.

He possessed a tenacious memory, and readily quoted in conversation the authors he had read, particularly the poets, and was a playful and entertaining companion when he found his company agreeable to him, capable of enjoying his humour, of benefiting by his information, or of eliciting reflection in his own mind; and it was seldom that a thinking man could be in his society without feeling roused by his energy.

The lectures which he delivered at the Royal Academy are published to the world, it is therefore not necessary to enter upon their merits; but it will be justice to their author, earnestly to recommend the perusal of them to all who wish to understand the principles of the art on which they treat. Unhappily the course was incomplete, as he only gave four lectures of the six prescribed to each professor. The world were deprived of all further benefit from his powerful intellects by his death, which occurred, after a lingering illness, in April 1807. He was honoured by an interment in St. Paul's cathedral, near the grave of Sir Joshua Reynolds, and his funeral was most respectably attended by almost all the members of the Royal Academy, and many of the nobility and gentry of the country.

OPILIO, in *Natural History*, a species of *Phalangium*; which see.

OPIMATORES, among the Romans, military men, who had the direction and management of the provisions, and were to take care that the army wanted nothing.

OPINION, **OPINIO**, denotes a probable belief; or a doubtful and uncertain judgment of the mind.

Opinion is better defined the assent of the mind to propositions not evidently true at first sight; nor deduced, by necessary consequence, from others that are so; but such as carry the face of truth.

The schools define opinion, *assensus intellectus cum formidine de opposito*; an assent of the understanding, with some fear or distrust of the contrary being true.

According to logicians, demonstration begets science, or knowledge; and probable arguments beget opinion.

Wherever the mind's acquiescence in a truth proposed to it is accompanied with any doubt, this is what we call an opinion, and it is the result of obscure and indeterminate perception. That the planets revolve about the sun is a branch of knowledge: that they are inhabited by beings similar to men is only an opinion. Hence, knowledge is said to be certain, opinion uncertain. Of opinions, some are probable and others improbable. A probable opinion is one, the evidence of the truth of which preponderates over that of its falsehood: and an improbable opinion is that, the evidence of whose falsehood preponderates over that of its truth.

Plato makes opinion a medium between knowledge and ignorance; clearer and more express than ignorance, yet more obscure and unsatisfying than knowledge.

OPISTHODOMUS, *οπισθοδομος*, among the *Athenians*, the public treasury, so called from its being situated on the backside of Minerva's temple. Here, besides other public money, a thousand talents were laid in store, against any very urgent occasion; but if any man expended them upon a trivial account, he was to be put to death. Also the names of all that were indebted to the commonwealth were entered in a register in this place. The tutelar gods of this

treasury, were Jupiter *Σωτήρ*, or the Saviour, and Plutus, the god of riches, whom they represented with wings, and placed next to the statue of Jupiter the Saviour; which was unusual in other places.

OPISTHOGRAPHUM, *οπισθογραφον*, among the *Ancients*, a waste-book, or schedule, on which were writ extemporary things that wanted to be revised and corrected afterwards.

The word is compounded of *οπισθεν*, *i.e.* afterwards, or on the backside, and *γραφω*, I write; because it was writ over again on the backside of every page, which was left blank for that purpose.

OPISTHOTONOS, from *οπισθεν*, backward, and *τενω*, to extend, in *Surgery*, that species of tetanus, in which the head and trunk are drawn backward by the muscles. See **TETANUS**.

OPIUM, in *Chemistry and Medicine*. Several vegetables furnish a milky fluid, which, when reduced to a proper consistency, may have similar properties to opium properly so called. Of these are the *lactuca virosa*, or the wild lettuce, as well as the garden lettuce. But it is furnished in the greatest abundance from the white poppy of the East, (*papaver somniferum*,) and also, in small quantity, from the other species of the poppy.

The white poppy is cultivated to great extent in Turkey, for the purpose of affording opium. After the flowering of the plant, when the capsule containing the seed has arrived at its full growth, slight longitudinal incisions are made in the capsules towards the evening. A milky juice oozes out, which is collected the next day. The excess of moisture being evaporated in the sun, it assumes the consistency fitted for making it into cakes, in which state it is found in commerce. This is generally called *Turkey opium*, to distinguish it from another kind brought from the East Indies, and known by the name of *East Indian opium*. This is generally softer than the Turkey, of a darker colour, less bitter, and more disagreeable to the taste, and has a disagreeable empyreumatic smell. It is not so strong as the Turkey, but considerably cheaper. When opium is soft and friable, of a blackish colour, and has an empyreumatic smell, it is bad. Its taste should be bitter but not sweet.

Opium softens with heat so as to adhere to the fingers, but it does not fuse. When it is reduced to powder, and ground into a pulp with alcohol or water, and an extra quantity of fluid added, the greatest part of it will dissolve by boiling it for some time, a great part of which is deposited on cooling. We have already given the means of separating a peculiar substance from opium, under the article **NARCOTIC Principle**; which see.

Both alcohol and water, therefore, appear to dissolve the principal part of opium, but the alcoholic solution is generally used in medicine.

The aqueous solution is rather less coloured than that with spirit. It has also less smell and taste. It affords a precipitate with carbonate of potash, with the muriates and nitrates of mercury, with acetate of lead, nitrate of silver, and a brown precipitate with the red sulphate of iron. Infusion of galls affords a precipitate with opium. In triturating opium to mix it with water, a glutinous or rather waxy substance adheres to the bottom of the mortar, which does not mix with the liquid. This is the insoluble part of opium.

From what is stated here and under the article **NARCOTIC Principle**, it will appear that opium principally consists of three substances, namely, the *narcotic principle*, to which it owes its property of lessening the sensibility of the system; of a resin, to which it owes its stimulating virtues, and its great inflammability; and the oxygenated extract, to which may be

be attributed its astringent qualities. It is no doubt on this account that medical men have differed so much as to its being a sedative or a stimulant. Most of them agree that the sedative effects which result from it, are greater than could result from the stimulus previously afforded. It is hoped that some ingenious experimenter will clear these anomalies by new researches. See *NARCOTIC Principle*.

OPIUM, formed from *σπος*, juice, in *Pharmacy*, &c. a narcotic, gummy-refinous milky juice, drawn from the heads or capsules of the white poppy, more especially abounding in the cortical part of the capsules, and afterwards inspissated. The capsules are powerfully narcotic, and anodyne; boiled in water they impart to the water their narcotic juice, together with other juices which they have in common with vegetable matters in general. The liquor, strongly pressed out, suffered to settle, clarified with whites of eggs, and evaporated to a due consistence, yields an extract which is about one-fifth or one-sixth of the weight of the heads. This possesses the virtues of opium, but must be given in double its dose to answer the same intention, which it is said to perform without occasioning a nausea and giddiness, the usual effects of opium. This extract was first recommended by Mr. Arnot (*Med. Ess. and Obs. Edinb. vol. v. p. 108.*); and a similar one is now received in the Edinburgh pharmacopeia. It is found very convenient to prepare the syrup from this extract, by dissolving one dram in two and a half pounds of simple syrup. The "*syrupus papaveris albi*," as directed by both colleges, is a useful anodyne, and often succeeds in procuring sleep, where opium fails: it is more especially adapted to children. White poppy heads are also used externally in fomentations, either alone, or more frequently added to the "*decoctum pro fomento*."

When the juice flows of itself, through incisions made in the poppy heads, it is properly called *opium*. When drawn by expression, it ought rather to be called *meconium*. The difference between the qualities and virtues of the two juices is very considerable. The former is preferable on all accounts, but it is exceedingly rare; the Turks, among whom it is produced, and who make great use of it, never allow it to be exported. So that it is the latter that is ordinarily used among us, and sold for opium.

Kæmpfer relates, that the heads, when almost ripe, are wounded with a five-edged instrument, by which as many parallel incisions are made at once from top to bottom; that the juice which exudes is next day scraped off, and the other side of the head wounded in like manner; and that the juice is afterwards worked with a little water, till it acquires the consistence, tenacity, and brightness of the finest pitch.

The most circumstantial detail of the culture of the poppy, and of the method of procuring the opium from it, is that given by Mr. Kerr, as practised in the province of Bahar: he says, "the field being well prepared by the plough and harrow, and reduced to an exact level superficies, is then divided into quadrangular areas of seven feet long, and five feet in breadth, leaving two feet of interval, which is raised five or six inches, and excavated into an aqueduct for conveying water to every area, for which purpose they have a well in every cultivated field. The seeds are sown in October or November. The plants are allowed to grow six or eight inches distant from each other, and are plentifully supplied with water. When the young plants are six or eight inches high, they are watered more sparingly, but the cultivator strews all over the areas a nutrient compost, of ashes, human excrements, cow-dung, and a large portion of nitrous earth, scraped from the highways and old mud-walls. When the plants are nigh flowering, they are watered profusely to increase the juice. When the capsules are

half grown, no more water is given, and they begin to collect the opium. At sun-set they make two longitudinal double incisions upon each half-ripe capsule, passing from below upwards, and taking care not to penetrate the internal cavity of the capsule. The incisions are repeated every evening, until each capsule has received six or eight wounds; they are then allowed to ripen their seeds. The ripe capsules afford little or no juice. If the wound was made in the heat of the day, a cicatrix would be too soon formed. The night-dews, by their moisture, favour the exsillation of the juice.

"Early in the morning, old women, boys, and girls, collect the juice by scraping it off the wounds with a small iron scoop, and deposit the whole in an earthen pot, where it is worked by the hand in the open sunshine, until it becomes of a considerable spissitude. It is then formed into cakes of a globular shape, and about four pounds in weight, and laid into little earthen basins, to be further excicated. These cakes are covered over with the poppy or tobacco-leaves, and dried until they are fit for sale. Opium is frequently adulterated with cow-dung, the extract of the poppy plant procured by boiling, and various other substances, which they keep in secrecy. Opium is here a considerable branch of commerce. There are about 600,000 pounds of it annually exported from the Ganges." *Med. Obs. and Inq. vol. v. p. 317.*

Opium is imported into Europe from Persia, Arabia, and other warm regions of Asia. It is brought into this country in chests from Turkey and India. The *Turkey opium* is in flat pieces, covered with leaves, and the reddish capsules of some species of rumex, which is considered as an indication of its goodness, as the inferior kinds of opium have none of these capsules adhering to them. This opium generally contains about $\frac{1}{4}$ th part of impurities. *East Indian opium* is in round masses, covered with successive layers of leaves, to the thickness nearly of $\frac{1}{4}$ th of an inch.

Dr. Charles Alston, professor of botany and the materia medica in the university of Edinburgh, has given us a dissertation on opium in the medical essays of that place, vol. v. art. 12. This gentleman is of opinion, that notwithstanding the authorities of Lemery, Savary, Monsieur de la Condamine, in the *Mem. de l'Acad. des Sciences* for 1732, all which would lead us to conclude we have nothing but the meconium, or the expressed juice or decoction of the plant, our opium is neither an extract, nor an inspissated expressed juice of poppies, but the milky juice drawn by incision from poppy heads. To shew this, the doctor, according to the directions of Dioscorides, on a dry day, before noon, cut off the crown of white poppy heads, so as to avoid penetrating into the cavity of the fruit, and collected the milk with a silver spoon in a china cup. The juice being exposed to the open air, in a few days thickened to the consistence of opium, and was of a fiery, hot, bitter taste, and foporiferous smell, and more so than the common opium, of a dark yellowish-brown colour on the outside, somewhat higher within, and appeared as if composed of drops; after ten years keeping, its colour and taste remained. This agreed with the account Bellonius, lib. iii. obs. 15. gives of the best opium. That which was gathered from the papaver vulgare, or wild poppy, was somewhat of a lighter colour; but Dr. Alston thinks this but accidental, as the milk soon turns black on the knife. He also slightly scarified some poppy heads, after the Persian manner. When the juice was thickened, he scraped off the opium, and obtained more of it than by the other method. To procure the tear in its utmost perfection, he cut off the star from several heads, and bending them down let the milk drop

drop into a cup. It grew solid as opium, and being formed into a lump, appeared uniformly white; nor was there any difference in the juice of different poppies.

Secondly, the doctor observes, that the extract and inspissated juice scarce any where resemble opium; nor is their taste and smell like it. The extract appears black when dried, and so does the juice, but when diluted, the first is brown and the latter green. The extract is tough and adhesive, the juice rough and friable, and grows mouldy a day or two after expression. Opium may possibly be mixed with either of these; and the greenish-brown opium may have some small portion of the juice in it. Its penetrating smell is certainly owing to the mixture of some aromatic substance.

Thirdly, opium contains more resin than either the inspissated juice or extract. One-third of opium appears to be resin, while the juice and extract scarcely yield one-tenth part.

Fourthly, if opium was not the tear of the poppy, there would be no occasion for sowing so many fields with poppies in Egypt, and other places. Nor would it be so powerful a medicine, for its anodyne virtues depend chiefly on the milky juice.

It is a popular error that there is any such thing as white opium; for though the juice, as it runs from the heads of the poppies, be of a milk-colour, it always becomes of a very deep brown as it thickens. Wherever it is found yellowish or soft, it is a sign that the juice has not had fire enough.

Most of the opium sold at Constantinople is brought from Anatolia, from a place called, by the Turks, *Aphium Carahiissat*, *i. e.* Black Caule of Opium. It is also produced in the territory of Thebes, in Egypt, whence the best opium was formerly called *Thebaic* opium: this differs from the *meconium*, which was made by the ancients of the expressed juice or decoction of the poppy, and which they justly deemed the "*meconium multum opio ignavius*."

Opium, according to the experiments of Dr. Alston, consists of five parts in twelve of gum, four of resin, and three of earth, or other impurities, not dissolvable either in watery or spirituous menstrua. From these last it is purified, in the shops, by softening the opium with boiling water, in the proportion of a pint to a pound, into the consistence of a pulp, with care to prevent its burning; and whilst it remains quite hot, strongly pressing it from the faeces through a linen cloth; the strained opium is then inspissated in a water-bath, or other gentle heat, to its original consistence. When thus softened with a small quantity of water, the gummy and resinous parts pass the strainer together; whereas, if dissolved by a larger quantity, they would separate from one another. Supposing that the resin of opium is as good, or as much wanted as the gum, or the mucilaginous part, brandy will be found the best menstruum.

The most active principles of opium are very fixed; for it keeps well, and, when forty years old, remains hard, solid, and retains its taste: and it seems that the practice of roasting opium, in order to correct it, by divesting it of its narcotic part, is of no service; and many other processes have been proposed for correcting the ill qualities which opium is supposed to possess, besides roasting it; such as fermentation, long-continued digestions or boiling, and repeated dissolutions and distillations. These processes, says Dr. Lewis, do not promise any singular advantage: and he adds, that diminishing the dose of opium is a more certain way of lessening its effects. Alkaline salts, he says, diminish the soporific virtue of the opium; fixed alkalies render it diuretic, while

volatile ones determine its action to the cutaneous pores; and acids almost entirely destroy its force.

Upon a chemical analysis, opium yields phlegm, urinous spirit, oil, a volatile and a fixed salt, and some earth; but little of the virtues of opium can be investigated, or explained, from its analysis, since simples, extremely different as to their effects on human bodies, afford the same principles on distillation, as Homberg has shewn by the analysis of the deadly nightshade, and cabbage. See *Mem. de l'Acad. des Sciences*, an. 1701.

The curious may find the analysis of opium in the above mentioned dissertation by Dr. Alston.

Opium is regarded as bad when it is very soft or friable, of an intensely black colour, or when mixed with many impurities. A weak or empyreumatic odour, sweetish taste, or the power of marking, when drawn across paper, a brown continuous streak, are also indications of inferior opium.

Turkey opium has a peculiar, strong, heavy, narcotic odour, and a bitter taste, accompanied with a sensation of acrid heat, a biting on the tongue and lips, if it be well chewed. Its colour, when good, is dark reddish-brown, and its texture compact and uniform. When soft, it is tenacious; but when long exposed to the air, it becomes hard, breaks with an uniform, shining fracture, is pulverulent, and affords a yellowish powder. It is inflammable, and partially soluble in water, alcohol, and ether. By long boiling in water under exposure to the air, its narcotic powers are impaired; yet nothing rises with water, when it is distilled with that fluid: though Beaumé asserts, that the odorous part of the opium is an oil. When carefully triturated with hot water, about five parts in twelve of the opium are dissolved and retained in solution, nearly six parts are simply suspended, and rather more than one part remains perfectly insoluble, of a viscid, plastic nature, somewhat resembling the gluten of wheat, but of a dark colour. This was regarded by Bucholz as caoutchouc; according to Proust, it contains wax; and Gren supposed it to be analogous to gluten. Mr. Thomson (London Dispensatory) says, that by dissolving alcohol on this substance, he found a small portion of it dissolved, acquiring a reddish-yellow colour, and becoming milky when added to water. Sulphuric ether, digested upon it, broke it down, and dissolved a portion of it, forming a yellowish tincture, which when evaporated in water left resin, a bitter extractive, and some acicular crystals of that salt, which Derosné supposed to be the narcotic principle. The insoluble part, after the action of the ether, was subjected to a set of comparative experiments with the gluten of wheat, when it afforded similar results with the majority of the tests employed. Hence, this part of Turkey opium appears to be a modification of gluten combined with resin, extractive, and a peculiar salt.

East Indian opium has a strong empyreumatic smell, and less of the peculiar narcotic heavy odour of the Turkey opium; the taste is equally bitter, but more nauseous, and it has less acrimony: it agrees with the Turkey opium in its other sensible qualities, except that its colour is blacker, and its texture less compact; and when triturated with water no insoluble plastic residuum is left, but it is altogether taken up; eight parts in twelve being dissolved, and the remainder suspended in the fluid.

The aqueous solutions of both kinds of opium are transparent when filtered, that of the East Indian sort having the deepest brown colour; neither is decomposed by alcohol, but both are precipitated by the carbonate of potash, although the pure alkali does not affect them; they are also precipitated by solutions of the muriate and nitrate of mer-

cury, the acetate and superacetate of lead, the nitrate of silver, and the sulphates of copper, of zinc, and of iron. They are also precipitated by infusion of galls; the precipitate, as Dr. Duncan justly observes (*Edinb. New Dispens.* 6th ed. 382.), resembling more that produced by cinchonin, than that by gelatine. The solution of acetate of barytes, does not alter the solutions of Turkey opium, but produces a copious precipitate with those of the East Indian; oxalic acid precipitates both, but the latter more copiously. From these experiments, says Mr. Thomson, opium appears to contain resin, gum, bitter extractive, a peculiar crystallizable salt, and sulphate of lime, which appears to be very abundant in the East Indian opium: the Turkish contains also a species of gluten.

It has been disputed, whether the activity of opium resides in its gummy or resinous parts. From the experiments of Hoffmann and Neumann, it seems to be neither in the gum, nor in the resin; but in a certain subtle part of the resinous matter, somewhat analogous to essential oils, but of a much less volatile kind: and they relate, that on boiling the opium in water, there arises to the surface a frothy, viscid, unctuous, strong-scented substance, to the quantity of two or three drams from sixteen ounces; that this substance, in the dose of a few grains, has killed dogs that could bear above a dram of crude opium; that in distillation with water, though it does not rise itself, it gives over, at least in part, the active principle of which it is the matrix; impregnating the distilled liquor with its scent and its soporific power; as essential oils exhale their odoriferous principle in the air, without being dissipated themselves. But what this subtle and active principle really is, in essential oils, odorous vegetables, or opium, is equally unknown. Neumann says, that he knows a preparation of opium, by which a whole chamber full of men may be presently stupefied, deprived of their senses, and even of their lives, without swallowing a single grain: and he thinks, that it operates much in the same manner as the vapours of burning charcoal, or as the exhalations of fermenting liquors.

When ether is used as a menstruum for opium, and the resin and extractive which it takes up are separated by evaporating the tincture on the surface of water, the pellicle of resin deposited is nearly insipid, while the extractive dissolved in the water has an intensely bitter taste: from this fact, and the circumstance already mentioned, of opium becoming inert when boiled in water, we might venture, says Mr. Thomson, to conclude, that the narcotic principle resides in the extractive; but Derosné has lately asserted, that the activity of opium depends on a peculiar salt. He evaporated a watery infusion of opium to the consistence of syrup, and digested the gritty precipitate formed by this evaporation in hot alcohol; as the solution cooled, a salt was formed, which by repeated solutions and crystallizations was obtained free from the resin, of a white colour, and in rectangular prisms with rhomboidal bases; these were inodorous, insipid, insoluble in cold water, but soluble in 400 parts of boiling water; soluble in 100 parts of cold, and 24 of boiling alcohol; soluble in hot ether and the volatile oils, but separating as those fluids cooled; and very soluble in all the acids. Given to dogs, it produced the effects of a strong dose of opium; and in a similar manner the bad effects were relieved by vinegar. Mr. Thomson, in repeating the experiments of Derosné, obtained a much greater proportion of crystals of this peculiar salt from East Indian opium than from that of Turkey, which, in his opinion, militates against Derosné's idea of its being the narcotic principle, as much larger doses of that variety of opium are required to

produce its narcotic effect on the system. Mr. Thomson has had an opportunity of ascertaining the power of the salt; but from Derosné's account, it is not much more powerful as a narcotic than opium itself. This latter writer concludes, from the effects of nitric acid and caloric on this salt, that it is composed of oxygen, hydrogen, azote, and carbon. It does not redden vegetable blues. *Annales de Chimie*, lxx. 270. 279.

The use of this celebrated medicine, though not known to Hippocrates, can be clearly traced back to Diagoras, who was nearly his contemporary; but its extensive practical utility has not been long well understood, and it may perhaps be dated in this country from the time of Sydenham. Opium is the chief narcotic now employed; it acts directly upon the nervous power, diminishing the sensibility, irritability, and mobility of the system; and according to Dr. Cullen, in a certain manner suspending the motion of the nervous fluid, to and from the brain, and thereby inducing sleep, one of its principal effects. From this sedative power of opium, by which it allays pain, inordinate action, and restlessness, it naturally follows, that it may be employed with advantage in a great variety of diseases. Indeed, there is scarcely any disorder in which, under some circumstances, its use is not found proper; and though in many cases it fails of producing sleep, yet if taken in a full dose, it occasions a pleasant tranquillity of mind, and a drowsiness which approaches to sleep, and which always refreshes the patient. Besides the sedative power of opium, it is known to act more or less as a stimulant, exciting the motion of the blood: but this increased action has been ingeniously, and, as Dr. Woodville thinks, rationally ascribed to that general law of the animal economy, by which any noxious influence is resisted by a consequent re-action of the system. By a certain conjoined effort of this sedative and stimulant power, opium has been thought to produce intoxication, a quality for which it is much used in Eastern countries.

Dr. Lewis has given us the following view of the general effects of opium. It renders the solids, while the operation of the opium continues, less sensible of every kind of irritation, whether proceeding from an internal cause, or from acrimonious medicines, as cantharides, and the more active mercurials, of which it is the best corrector. It relaxes the nerves; abating or removing cramps or spasms, even those of the most violent kind; and increasing paralytic disorders and debilities of the nervous system. It incrassates thin serous humours in the fauces and adjacent parts; by which means, it proves frequently a speedy cure for simple catarrhs and tickling coughs; but in phthisical and peripneumonic cases, dangerously obstructs expectoration, unless this effect be provided against by suitable additions, as ammoniacum and squills. It produces a fullness and distension of the whole habit; and thus exasperates inflammations both internal and external, and all plethoric symptoms. It promotes perspiration and sweat; but restrains all other evacuations, unless when they proceed from relaxation and insensibility of the parts, as the colliquative diarrhoea in the advanced state of hectic fevers. It promotes labour-pains, and delivery more effectually than the medicines of the stimulating kind usually recommended for that purpose; partly perhaps by increasing plenitude, and partly by relaxing the solids, or taking off spasmodic strictures. And indeed all the preceding effects are perhaps consequences of one general power, being nearly allied to those, which natural sleep produces.

The operation of opium is generally accompanied with a slow but strong and full pulse, and a slight redness, heat, and itching of the skin: it is followed by a weak and languid

gird pulse, lowness of the spirits, some difficulty of breathing, or a sense of tightness about the breast, a slight giddiness of the head, dryness of the mouth and fauces, and some degree of nausea. Given on a full stomach, it commonly occasions a nausea from the beginning, which continues till the opium is rejected along with the contents of the stomach. Where the evacuation of acrid humours, accumulated in the first passages, is suppressed by it, great sickness and uneasiness are generally complained of, till the salutary discharge either takes place again spontaneously, or is promoted by art.

An over-dose occasions either immoderate mirth or stupidity, a redness of the face, swelling of the lips, relaxation of the joints, vertigo, deep sleep, with turbulent dreams and startings, convulsions, and cold sweats. Geoffroy observes, that those who recover are generally relieved by a diarrhoea, or by a profuse sweat, which is accompanied with a violent itching. The proper remedies, besides emetics, blisters, and bleeding, are acids and neutral mixtures. Dr. Mead says, he has given, with extraordinary success, repeated doses of a mixture of salt of wormwood and lemon juice. The first thing to be done for counteracting the injurious effects of too large a dose, is the exhibition of a powerful emetic: and for this purpose, \mathfrak{z} i of sulphate of zinc, or from grs. v to grs. x of sulphate of copper, dissolved in water, should be immediately swallowed; and the vomiting kept up for a considerable time, and urged by irritation of the fauces. Large draughts of vinegar and water, or other acidulated fluids, should be taken; and the powers of the habit supported by brandy, coffee, and cordials. The sufferer should be kept awake, and, if possible, in continued gentle motion. Currie recommends for removing the drowsiness, the affusion of warm water at 106° or 108° .

A long continued use of opium is productive of great relaxation and debility, sluggishness, heaviness, loss of appetite, dropies, tremors, acrimony of the humours, frequent stimulus to urine, and propensity to venery. On leaving it off, after habitual use, an extreme lowness of the spirits, languor, and anxiety succeed; which are relieved by having again recourse to opium, and, in some measure, by spirituous or vinous liquors. Lewis's Mat. Med.

The virtues of opium, internally taken, depend chiefly on its action on the stomach. There are many instances of terrible symptoms, and death itself, caused by narcotics, before they went out of the stomach, and without inflaming it, or causing any visible change in it, far less vitiating the mass of blood; and also the same symptoms being removed, and death prevented by vomiting. Dr. Alston is also of opinion, 1. That the anodyne and hypnotic virtues of opium do not depend on its action on the brain or on the blood. 2. That it affects first and principally the nerves to which it is applied; next such as more immediately communicate with them; then those which serve for sensation and voluntary motion; and, last of all, by consent, the whole nervous system. 3. That this impression on the nerves differently affects the sensorium commune and the mind, according to its degree, and the nature and function of the nerves primarily acted upon. 4. That the primary, or first observable effect of the mechanical impression of the narcotic part of opium on the nerves, is the relaxation of the fibres. Now as this relaxation of the nerves, and consequently of the moving fibres, demonstrates opium to be more than a palliative remedy in a great many diseases; so it is not difficult by it to account for its bad as well as good effects. For by relaxing to a certain degree, it may prove anodyne, cordial, diaphoretic, hypnotic, &c. or cause stagnations, deliriums, lethargies, apoplexies, and death.

The particular disorders in which the use of opium has been recommended are the following. In most continued fevers of this climate, though originating from contagion, or certain corruptions of human effluvia, &c. there is, at the beginning, more or less of an inflammatory diathesis; and while this continues, opium would generally aggravate the symptoms, and prove dangerous. Its use is likewise forbidden in the more advanced stage of this fever, whenever topical inflammation of the brain is ascertained, which sometimes exists and produces delirium, though other symptoms of the nervous and putrid kind prevail. But when irritation upon the brain is not of the inflammatory kind, and debility has made much progress, or where delirium is accompanied with spasmodic affections, opium is a sovereign remedy, and may be employed in large doses every eight hours, unless a remission of the symptoms and sleep take place. In typhus, when given in small doses frequently repeated, opium is an useful assistant to wine and tonics, in supporting the vis vitæ; and at the same time allays irritation, and obtunds the susceptibility of those morbid impressions which occasion watchfulness, delirium, tremors, and subultus tendinum. It should be administered, however, with caution; for if the heat of the body be much above the natural standard, and the skin dry, opium increases these symptoms, augments thirst, and occasions restlessness. But if moisture be coming on, opium accelerates it, and tranquillity and sleep follow. Hence Dr. Currie's advice should be regarded, not to give the evening dose of opium in these fevers till very late, or about one or two o'clock in the morning, when the heat is subsiding; or first to lower the temperature, and excite sensible perspiration by the affusion of cold water, or tepid sponging. Opium is hurtful also when there is a disposition to inflammation, particularly in the chest, and when there is much determination to the head.

In intermittent fevers, opium, in combination with other medicines, was much used by the ancients; but since the introduction of the Peruvian bark, it is seldom confided in for the cure of these disorders. It has, however, been strongly recommended as an effectual means of stopping the recurrence of the febrile symptoms; and has been given, before the fit in the cold stage, in the hot stage, and during the interval, with the best effects; producing immediate relief, and in a short time curing the patient, without leaving those abdominal obstructions which have been ascribed to the bark. Berryat, who, in the "*Mem. présentés à l'Acad. Royal. des Sci. 1755, t. ii.*" strongly recommends the use of opium in intermittents, and advises it to be given along with an infusion of centaury, an hour before the access of the paroxysm. Lind (*Dis. in hot Climates*) prefers giving it half an hour after the commencement of the hot fit. In these fevers, perhaps, says Dr. Woodville, the best practice is to unite opium with the bark, which enables the stomach to bear the latter in large doses, and adds considerably to its efficacy.

In inflammatory diseases, the use of opium has been much condemned; and Young has established a general rule, "that opium is improper in all those diseases in which bleeding is necessary." This principle, however, has been much disputed; and it is liable to numerous exceptions, specified by Dr. Cullen in his "*Materia Medica.*"

When opium is so managed as to procure sweat, it will tend to remove an inflammatory state of the system, and may prove generally useful, of which we have a notable instance in the cure of acute rheumatism by means of Dover's powder. In this latter disease it is given united with ipecacuanha, or antimonials and nitre, and always gives relief, when it determines to the surface.

For the small-pox, opium, since the time of Sydenham, has been very generally and successfully prescribed, especially after the fifth day of the disease; but during the first stage of the eruptive fever, it has been said that it always does harm; an opinion which Dr. Woodville's experience at the Small-pox Hospital contradicts: for he says, that even at that period of the disorder, we often find the pulse languid, and the countenance pale, though pains in the loins and the head are at the same time very severe. These symptoms, with restlessness, and other signs of irritability, which appear for some days after the attack of the disease, are considerably relieved by opium; to which, however, we usually add camphor and vinum antimonii tartarifati, always taking care to keep the body sufficiently open by the frequent dose of a proper cathartic. In malignant scarlatina, pemphigus, and several others of the exanthemata, it is equally valuable; but in this class of diseases its use is contra-indicated, when the fever is inflammatory.

In hæmorrhagic disorders the use of opium is inferred, from its known effects in restraining all the excretions, except that of sweat; but unless the hæmorrhages be of the passive kind, or excited by irritation, unattended with inflammation, opium may produce considerable mischief, and therefore its use in these complaints requires great circumspection. Hence arises its efficacy in the floodings of irritable habits after abortions, and in phthisical hæmoptysis. It has been also recommended after blood-letting, in the hæmoptysis and hæmatemesis of the later months of pregnancy. In dysentery, opium may be occasionally employed to moderate the violence of the symptoms. In diarrhœa, especially when the acrimony has been carried off by a continuance of the disease, opium is a certain and efficacious remedy. In cholera and pyrosis, opium is the remedy chiefly confided in. In chorea Sti. Viti it has been found beneficial, when preceded by strong cathartics, or combined with these. In epilepsy it is useful, when given in combination with musk. In spasmodic asthma it shortens the paroxysms, abates the violence of the cough in pertussis, when administered after the primary fever subsides. Although opiates are hurtful at first, and check expectoration in catarrh, yet when the cough is obstinate, their good effects are unquestionable; and in the contagious catarrh, or influenza, an opiate at bed-time is requisite for quieting the cough in every stage of the disorder. In colic it is employed with laxatives, and often prevents ileus and inflammation, by relieving the spasm. Even in ileus and incarcerated hernia, it is often found to allay the vomiting, the spasms, the pain, and sometimes to diminish the inflammation, and prevent the gangrene of the strangulated gut. Opium has been lately recommended for the cure of the lues venerea, and some have said that it has succeeded when mercury has failed: but however it has been extolled by some foreigners, its antivenereal powers have been exploded in this country; though, as an auxiliary to mercury, it has been considered as useful, by diminishing the sensibility of the stomach and bowels, and thus preventing many of those inconveniences which this mineral is apt to excite in the primæ viæ, and allowing it to be more easily introduced into the system. Its use in preventing and stopping the progress of gangrene is well established. Opium is successfully used in various species of tetanus, and affords relief to various spasmodic and convulsive symptoms occurring in several diseases. Indeed, in all cases where the irritability is morbidly increased, and where it is of importance to lessen pain, and procure sleep, opium is undoubtedly the most valuable article of the materia medica. But its use is contra-indicated in all morbid states of the body, when a strong inflammatory

diathesis exists; in pulmonary affections, when the cough is dry and hard, and the expectoration difficult and scanty; and if not hurtful, its utility is doubtful in mania, in which it generally occasions restlessness, instead of procuring sleep.

Although some difference of opinion subsists with regard to the external application of opium, it has been maintained that, externally applied, it is almost as efficacious as when it is taken into the stomach, and that it produces its narcotic effects without affecting the head, or occasioning nausea. Accordingly it has been said, that when applied to the skin, it allays pain and spasm, procures sleep, and produces other salutary effects. The usual mode of applying it is in form of frictions, either combined with oil, or with the camphor liniment, or in the form of tincture; and in this mode it may be used in all the diseases above enumerated. Its good effects in colic, also in symptomatic trismus, when rubbed on the jaw, and when applied to the scrobiculus cordis by means of pledgets soaked in the tincture, have been observed by medical practitioners. A piece of solid opium, stuffed into a carious tooth, relieves the pain of tooth-ache; and introduced into the rectum, either in a solid form, or dissolved in water as an enema, affords relief in tenesmus, in painful affections of the prostate gland, and in spasmodic strictures. A weak watery solution of it is an useful adjunct to injections in gonorrhœa, and to collyria in ophthalmia; and the vinous tincture dropped into the eye removes the suffusion which often remains in that disease, after the inflammation has been subdued, and restores the tone of the diseased organ. One inconvenience following the moderate application of opium, mandragora, and hyoscyamus for pains of the eyes, taken notice of by Galen, is the midriasis, or a preternatural dilatation of the pupils. Mr. Ray gives a notable instance of this kind, arising from the application of a leaf of the deadly nightshade to a cancerous ulcer a little below the eye. The uvea, in a night's time, entirely lost its muscular force, and was so relaxed, that the pupil, in the clearest light, remained four times bigger than that of the other eye. The effects of opium on other animals are not much different from its effects on men. Applied to the naked nerves of animals, it produces immediate torpor, and loss of power in all the muscles with which the nerves communicate. Dr. Alston put a few drops of a solution of opium into a frog's stomach, and the circulation of the blood of the animal being examined by a microscope, no alteration was perceived in the blood, as to its consistence, colour of the serum, magnitude, figure, or colour of the red globules; but its velocity was surprisingly diminished. In about half an hour, the blood regained its common celerity, and the frog its vigour. On giving the creature a second dose, the blood moved slower than it did the first time, and its velocity gradually decreasing, stagnated first in the smaller, then in the larger vessels; and in a quarter of an hour the frog expired. It is remarkable, that notwithstanding the diminution of the velocity of the blood, the pulse was not less frequent; and that even when the circulation stopt in the foot, the pulse remained visible by an undulatory motion. On opening the frog, its stomach was found full of a clear mucus, tinged with the opium, and every thing also seemed perfectly natural. This experiment was repeated several times, with the same appearances.

A dog being killed by an injection of a solution of opium into his crural vein, on opening his thorax the lungs were found found, but very small, and white, without any blood in them. The heart was big, and all its great vessels distended with blood; but nothing preternatural was observed in the brain or abdomen.

Opium is exhibited either in substance as a pill or under the

the form of tincture. It is necessary, however, to take heed that it be not combined with substances which decompose it; and therefore solutions of oxymuriate of mercury, acetate of lead, sulphates of zinc, iron, and copper; of the carbonates of alkalies, lime-water, infusion of galls, and infusion of yellow cinchona bark, are incompatible in prescriptions with opium.

The requisite dose of opium varies in different persons, and in different states of the same person. A quarter of a grain will in one adult produce effects which ten times the quantity will not do in another, more especially if he has been previously accustomed to the use of it; and a dose that might prove fatal in cholera or colic, would not be perceptible in many cases of tetanus or mania. A quarter of a grain, frequently repeated, is in general sufficient to keep up its stimulant effect; and the quantity of from gr. j to gr. ij acts as a narcotic, and produces sleep; while in tetanus, hydrophobia, and some other diseases, f3v's of laudanum have been given in twenty-six hours, without occasioning any bad effects, or even producing sleep. The lowest fatal dose to those unaccustomed to take it seems to be about four grains; but a dangerous dose is so apt to produce vomiting that it has seldom time to occasion death. When given in too small a dose, it often produces disturbed sleep, and other disagreeable consequences; and in some cases it seems impossible to be made to agree in any dose or form. Often, on the other hand, from a small dose, sound sleep and alleviation of pain will be produced, while a larger one occasions vertigo and delirium. Some prefer the repetition of small doses; others give a full dose at once; its operation is supposed to last about two hours. It is use that makes the quantity of opium safe, and even beneficial, which would otherwise prove poisonous. Daily experience confirms this; and they who habituate themselves to opium, find it as necessary as spirituous liquors to tipplers, and can take fifty or sixty grains: Charas says, that he has taken twelve grains himself, and adds, that he knows one who made no scruple of thirty-six. And in the Phil. Transf. we have an instance of one Mr. Lovelock, who, in a fever, in three days time, took one hundred and two grains.

A few grains will destroy a person unaccustomed to it; but some disorders, as madness, enervate its force. Among the Eastern nations, a dram of opium is but a moderate dose. The Turks are said to take this quantity when they go to battle, or undertake any affair that requires vigour and strength. Garcias mentions one who took ten drams every day, and though she appeared stupid and sleepy, yet she disputed very readily and learnedly on any subject. It is remarkable that, notwithstanding this excessive use of opium, the Turks are generally long lived, if we credit Bellonius.

The action of opium is very analogous to that of wine or vinous spirits; the good and ill effects of both differ little. See Wedelius in his Opiologia, and Geoffroy's *Materia Medica*. Platerus affirms that wine is narcotic, and Sydenham, that opium is the most excellent cordial in nature.

Dr. Smyth, while at Smyrna, took pains to observe what the doses of opium taken by the Turks, in general, were. He found that three drams in a day were a common quantity among the larger takers of it, but that they could take six drams a day without mischief. A Turk eat this quantity before him, three drams in the morning, and three in the evening, with no other effect than its giving him great cheerfulness. But the taking it thus habitually greatly impairs the constitution; the persons who accustom themselves to it, can by no means live without it, and are feeble and weak; their legs are usually thin, and their gums eaten away, so that the teeth stand bare to the roots; they arc

also often of a yellow complexion, and look much older than they really are. The Turkish messengers, when sent upon business of haste, always carry opium with them, and take largely of it when tired; they say it immediately gives them strength and spirits to proceed, taken with proper precaution. Phil. Transf. N^o 223.

Dr. Russell, in his "History of Aleppo," informs us, that the greatest quantity he knew to be taken, was three drams in twenty-four hours; and the immediate effects which he observed it to have on such as were addicted to it, were, that their spirits were exhilarated, and from a dosing, depressed state into which they sunk, after passing the usual time of taking their dose, they became quite alert. The consequences of a long use of it are, that they soon look old and befuddled, like such as in Europe have ruined their constitutions by hard drinking. The habitual use of it cannot be too much reprobated. It impairs the digestive organs, consequently the vigour of the whole body, and destroys also gradually the mental energies. The effects of opium on those who have been addicted to it, says Russell, are at first obstinate costiveness, succeeded by diarrhoea and flatulence, with loss of appetite and a sottish appearance. And it may be considered as a point of fact, that they seldom live to a good old age: though they are rarely carried off by dropsies or such other diseases, which are the usual consequences of hard drinking amongst us; but having first lost their memory, and most of their intellectual faculties, they decline, in all appearance, in the same way as those who sink under the weight of years.

We have an account, in the Memoirs of the Academy of Sciences at Paris, of the death of a young man at Cairo, from his being decoyed into taking a very large dose of this medicine. Among a number of young people in that city, who frequently drank together, there was one who always boasted of his superior power to bear a large quantity of liquor; and his companions, determined to get the better of him for once, dissolved, without his knowing of it, a dram of opium in the liquor he was to drink; the consequence was, that, instead of falling asleep, as they expected he would, he fell into violent deliriums, and afterwards into a profound and dead sleep.

The next morning his comrades went to see him, and triumphed in their victory, but found him dying, looking livid, without pulse, and with his mouth closed. They sent for assistance, but in vain. After the death of the person, the body, arms, and thighs, became covered with livid tumours, as big as the head of a young child, and these emitted an intolerable stench, almost as soon as the corpse was cold. There is one very singular accident in regard to this case, which is, that this stench allured all the cats from the neighbouring houses, who came with great eagerness, and were hardly prevented from devouring the body.

The officinal preparations of opium are opium purificatum, confectio opii, electuarium catechu, extractum opii, pilulæ opii, pilulæ saponis cum opio, pulvis opiatu, pulvis cornu ulsi cum opio, pulvis cretæ comp. cum opio, pulvis ipecacuanæ comp., tinctura opii, tinctura camphoræ composita, tinctura opii ammoniata, and trochisci glycyrrhizæ cum opio.

The *opium purificatum*, or purified opium, of the Dublin dispensatory, is prepared by cutting one pound of opium into small pieces, and digesting it in 12 pints of proof spirit with a gentle heat and frequent agitation, until the opium is dissolved; then filtering the solution through paper; and distilling it from a retort to separate the spirits; pouring in the residuary liquor, and evaporating it until the extract be of a proper thickness. Purified opium

opium must be kept in two flates; one soft, proper for forming pills, and one hard, capable of being reduced to powder.

The *confectio opii* of the London pharmacopeia is prepared by taking 6 drams of hard opium powdered, 1 oz. of long pepper, 2 oz. of ginger root, and 3 oz. of caraway seeds; and rubbing the opium in a pint of syrup made hot; then adding the remaining articles pulverized, and mixing the ingredients.

The *electuarium opiatum*, or opiate electuary, formerly *electuarium thebaicum* or thebaic electuary of the Edinb. pharm., is composed of 6 oz. of aromatic powder, 3 oz. of Virginian snake-root in fine powder, half an ounce of opium, diffused in a sufficient quantity of Spanish white wine, and a pound of syrup of ginger; which ingredients are mixed so as to make an electuary.

The operation of the opium in these preparations is modified by the aromatics. They are intended as substitutes for the mithridate and theriaca of the old pharmacopeias. They are stimulant narcotics; and are usefully employed in atonic gout, flatulent colic, and in diarrhoeas, unattended with inflammatory symptoms. Thirty-six grains of the London confection contain 1 grain of opium, and the same quantity is contained in 43 of the Edinb. electuary. The dose is from grs. x to f3j, given in the form of bolus, or diffused in the chalk mixture.

The *electuarium mimose catechu*, olim *confectio Japonica*, electuary of catechu, formerly Japonic confection of Edinb. pharm., is composed of 4 oz. of extract of catechu, 3 oz. of kino, of cinnamon bark and nutmegs, of each 1 oz., 2½ lbs. of opium, diffused in a sufficient quantity of Spanish white wine, and 2½ lbs. of syrup of red roses boiled to the thickness of honey. Reduce the solid ingredients to powder, and then mix them with the opium and syrup so as to form an electuary. The *electuarium catechu compositum*, or compound electuary of catechu of the Dub. pharm., consists of 4 oz. of catechu, 2 oz. of cinnamon bark, 3 oz of kino; rub these to powder, and add of hard refined opium diffused 1½ dram in Spanish white wine, and 2½ lbs. of syrup of ginger boiled to the consistence of honey; and mix them.

These are useful combinations as astringents and aromatics; and may be efficaciously given in diarrhoeas, and the last stage of dysentery, either in the form of bolus, or diffused in some distilled water. The dose is from ʒj to ʒij. Ten scruples contain one grain of opium.

The *extractum opii*, extract of opium of the Lond. pharm., is formed by taking ½ lb. of opium sliced, and 3 pints of water; pouring a small portion of the water upon the opium, and macerating for twelve hours, that it may become soft; then adding gradually the remaining water, rubbing them together until they be well mixed, and setting the mixture apart that the feculencies may subside; lastly, straining the liquor, and evaporating it to a proper consistence.

The *extractum opii aquosum*, or watery extract of opium of the Dub. Ph., is formed by rubbing two ounces of opium in a pint of boiling water for ten minutes, and, after a little time, pouring off the solution; then rubbing the residue of opium in an equal quantity of boiling water for the same time, pouring off this solution, and repeating the same operation a third time; then mixing together the decanted solutions, and exposing the mixture in a broad open vessel to the air for two days; and, lastly, straining it through linen, and by slow evaporation forming it into an extract.

From lbs of crude opium ʒijss only of extract are obtained by following the directions of the London college. This extract, which is inodorous, of a bitter taste, and of a

very deep brown colour, not altogether soluble in water, and not precipitated from its solution by alcohol, nevertheless affords precipitates with the following solutions, which should not therefore enter into prescriptions with its solution, viz. solutions of astringent vegetables. the alkaline carbonates, corrosive muriate of mercury, sulphate of copper, sulphate of zinc, acetate of lead, and nitrate of silver. This extract is supposed to possess the narcotic and anodyne powers of opium, but to produce its effects with less subsequent derangement of the nervous system. It is therefore supposed to be well adapted for the diseases of children, and of persons of very irritable habits. The dose is from gr. j to grs. vi for an adult. The officinal preparation is *syrupus opii*. See SYRUP.

For an account of *pills*, *powders*, and *tinctures* of opium, see the respective articles; and for the officinal preparations of poppy capsules, see PAPAVER. Woodville's Med. Bot. Thomson's London Dispensatory.

OPIMUM *Cyreniacum*, in the *Materia Medica*, a name given by some of the writers of the middle ages to assa fœtida. This was the *scordolafaron* of the Greek writers of those times, and was called *Cyreniacum* from the place whence it was principally brought. Avicenna tells us, that, in his time, it was brought principally from Kirvan, and that is Cyrene.

OPIUS, OPII, in *Ancient Geography*, a town of Asia, near the Euxine sea, between the mouths of two rivers, and E.S.E. of Trapezus.

OPIZUM, a town of Thrace, between Hadrianopolis and Philippopolis.

OPLITODROMI, Οπλιτοδρομοι, among the Greeks, a designation given to those who ran in armour, at the Olympic, and other games.

The word comes from the Greek *οπλον*, armour, and *δρομος*, a race.

OPOBALSAMUM, in *Pharmacy*, a whitish juice, gum, or resin, distilled from the branches of a tree, called *balsamum*, or the balsam-tree. See AMYRIS.

To obtain the balsam, the bark is cut by an ax, when the juice is in its strongest circulation, in July, August, and the beginning of September. It is then received into a small earthen bottle, and every day's produce collected and poured into a larger, which is kept closely corked. The first that flows, called "opobalsamum," is of a light yellow colour, apparently turbid. It afterwards becomes clear, fixed, and heavier; and the colour by degrees to a golden yellow. The "opobalsamum" of the ancients was composed of the green liquor found in the kernel of the fruit; the "carpobalsamum," the next in esteem, was made by the expression of the ripe fruit; and "xylobalsamum," or worst kind, by the expression or decoction of the small twigs. In the earlier ages, this balsam was esteemed as a medicine of almost universal virtue; and at the present day the Arabs use it in all complaints of the stomach and bowels, reckoning it a powerful antiseptic, and preventive of the plague; but its chief use among the Turkish ladies is as a cosmetic. It is never brought genuine into this country. See BALSAM of Gilead.

OPOCALPASON, OPOCARPASON, οποκαλπασον, οποκαρπασον, the juice of a tree called *calpasi*; this juice resembles myrrh, but is poisonous and deadly, inducing a strangulation. Galen, de Antidot. lib. i. says, that in the course of his time, he had observed the fatal effects in many who had ignorantly taken myrrh mixed with opocalpasm. For they who prepare antidotes, he says, purposely mix this as an ingredient, taking it for the best sort of myrrh; because they had observed it to be a very good medicine in collyria,

collyria, where it attenuates fanies without corrolivenefs, and sometimes removes an incipient cataract. And if you put, says he, this kind of myrrh into a plaster, cerate, or any attenuating medicine, to be outwardly applied, you will increase its virtue, but the effects of it taken into the body are deadly. James.

OPODELDOC, in the *Materia Medica*, the name of a plaster said to be invented by Mindererus, though often mentioned by Paracelsus. There used to be a famous popular ointment under the name of opodeldoc, which, it is said, was thus prepared.

Take of the root of marshmallows, comfrey, gentian, long birthwort, angelica, of each one ounce and a half; of the herbs fanicle, ladies' mantle, mouse-ear, colt's-foot, snakeroot, periwinkle, bruised, of each half a handful; of the leaves of rosemary, sage, and lavender, of each one handful; juniper berries, two ounces; cumin seeds, one ounce; camphor and castor powdered, of each one ounce and a half; and of spirit of wine, three pints and a half.

Put all into a glass cucurbit, well luted, and digest for ten hours in balneo Mariæ, that is in hot water, but not to boil, then strain; and the spirit of wine being sufficiently impregnated with the ingredients, then add one pound of Castile soap shaved thin; digest in the same manner as before, until the soap is dissolved.

Lute the juncture carefully, with two or three doubles of paper, daubed over with the white of eggs, and tied about with thread; the luting being dried, then digest in balneo Mariæ for ten hours, the matras being fixed in the middle of the kettle, with a layer of straw under it, to keep it at the distance of two inches from the bottom: for the first eight hours, keep the water so hot about it, that you can scarce hold your finger therein; and the two other hours augment the heat, but not so much as to make the water boil.

After the spirit of wine is thoroughly impregnated with the tincture of the roots, herbs, leaves, and powders, cool it gently, and straining it through a linen cloth, pour it again into the matras, with one pound of Castile soap, shaved thin; then fit the vessel of encounter to the matras; lute the junctures, and digest as before, till the soap is entirely mixed with the spirit, and the whole reduced to an ointment; then take out the matras, and suffer it to cool.

If the doses and other directions are duly observed, it will be of the consistence of an unguent, neither too thick nor thin, and the method of trying if it is truly prepared, is, to rub some of it on your hand, which it will immediately penetrate, leaving only a greenish stain; though the natural colour of the ointment is brown. It is excellent in strains, relaxations of the sinews in horses, as well as in the human kind; also in all pains, numbness, weakness in the joints, or other parts, being well rubbed in. James.

The Edinburgh Pharmacopeia directed the opodeldoc to be made in a much more simple manner, viz. by digesting two ounces and a half of Spanish soap, in a pint of rectified spirit of wine, and afterwards adding half an ounce of camphor, a dram of oil of rosemary, and a dram of oil of origanum. See SOAP.

OPODEOCELE, in *Surgery*, a hernia at the foramen ovale of the pelvis. See HERNIA.

OPODIPE, in *Geography*, a town of New Navarre; 170 miles S. of Casa Grande.

OPOGKA, a town of Russia, in the government of Pskov, on the Velika. N. lat. 56° 40'. E. long. 29° 14'.

OPOLLA, a town of Poland, in the palatinate of Sandomirz; 30 miles W.S.W. of Sandomirz.

OPOORAGE, a small island near the E. coast of New

Zealand, a little to the S. of Mercury bay. S. lat. 56° 51'. W. long. 183° 54'.

OPOPANAX, *Οποπαναξ*, formed from *οπος*, juice, and *παναξ*, the name of the plant which yields it, or *Opopanax*, in *Pharmacy*, a concrete gummy resinous juice, of a reddish-yellow colour, yellow and speckled with white on the outside, paler within, and frequently variegated with large white pieces; fatty, and brittle, of a bitter, acrid, and somewhat nauseous taste, and a very strong, disagreeable smell. Its specific gravity is 1.622. It appears to be a compound of gum, resin, and essential oil.

The Latins call it *panax Herculeum*, from Hercules, who is supposed to have first discovered its specific virtues. It is one of the three celebrated panaceas, or universal medicines, to which the ancients attributed such wonderful virtues. The two others are the *Asclepium* and *Chironium*; the first found by *Æsculapius*, the second by Chiron.

The gum opopanax flows by incision from the roots of a plant (the *PASTINACA Opopanax*, which see,) and being dried in the sun, is brought from Turkey, and the East Indies, in chests; and is sometimes in tears or drops, but more usually in irregular lumps. The plant grows abundantly in Achaia, Boeotia, Phocis, and Macedonia. There are three kinds of it imported; that in tears; that in the mass; and that counterfeited, or flatted. The first is the best, and the second is the better, as it has the more tears; the third is a rank sophistication, and good for little.

When triturated with water, about one-half of it dissolves, forming an opaque milky solution, which, on standing, deposits a portion of resinous matter, and becomes yellowish. Alcohol acts upon it freely; and in distillation either with it or with water, the odour of the opopanax is very strongly communicated to the fluids, but scarcely any oil is obtained in a separate state. This gum-resin is regarded as antispasmodic and emmenagogue, and as such has been used in hysteria and chlorosis; but it is now very seldom ordered. The dose may be from grs. x to 3ss. Woodville. Thomson.

OPOPIA, a name given by some anatomical writers to the bones which form the receptacle of the eyes.

OPORICE, a name given by the ancients to a medicine composed of the autumnal fruits, and extolled for its great virtues against weaknesses of the stomach and dysenteries.

It was composed of five quinces with their seeds, as many pomegranates, a pint of services, a pint of Syrian sumach, and half an ounce of saffron; all these were put together into a gallon of must, and boiled over a very gentle fire to the consistence of honey, with great care to avoid burning.

OPORINUS, JOHN, in *Biography*, a learned printer, born at Basil in 1507, was the son of a painter, in indigent circumstances, named Herbst. He was instructed in the elements of the Latin language by his father, and afterwards passed four years at the university of Strasburg, maintaining himself by teaching the younger students, by copying manuscripts, and correcting the press. When, by his services in the cause of literature, he felt himself of sufficient consequence to assume a classical name, he changed that of Herbst, signifying Autumn or Harvest, to Oporinus, which has the same meaning in the Greek language, and to improve his circumstances, he married an old lady who was possessed of a good fortune, the whole of which would have ill compensated for her crabbed temper; nevertheless, at her death the property was transferred to other persons. He was advised to study physic, and engaged himself as pupil and secretary to the famous Paracelsus. This master promised to communicate to him some medical secrets; but failing in the

the performance, Oporinus left him, and set up a school for instructing young people in the classics at Basil. At length he went into the printing business, in partnership with a person named Robert Winter, who gave himself, according to the fashion of the times, the Greek name of Chimerinus. He was indefatigable in his employment, keeping, by his sole labour, six presses at work, and publishing no book which he had not corrected himself. His industry was not requited by good fortune: perhaps he was too much of a scholar to be a successful man of business. He died in debt at the age of sixty-one. Being an accurate judge of manuscripts, he printed none but the most valuable, and he took care that they should appear in the most correct form. He was author of many excellent notes upon the books which he printed, and compiled very useful tables of contents and indexes of others. His principal writings were "Notes upon Solinus;" "Scholia upon the Tusculan Questions of Cicero;" and also upon other works of that author; "Notes upon some Parts of Demosthenes;" "Darii Tiberii Epitome Vitarum Plutarchi ab innumeris mendis repurgata;" "Proprium Nominum Onomasticon." Some of his Latin letters are printed in a collection of epistles published at Utrecht in 1697. Moreri.

OPORTO, or PORTO, in *Geography*, the largest city, Lisbon excepted, and sea-port, of Portugal, in the province of Entre Duero e Minho, situated on the declivity of a hill, in an elevated situation near the river Duero, and about three-fourths of a league from its mouth. It is the chief town of a corregimento, and the seat of a corregedor, a provedor, and a military governor, being a place of arms: it is also the see of a bishop, who chiefly resides at Mezanfrio. Murphy states the number of inhabitants at 63,505; but Link, on the authority of the corregedor, estimates the population at this time to be about 30,000. Oporto has four suburbs, seven parishes, and twelve religious houses. On one side the remains of the walls and gates still exist; otherwise the town is quite open, and has no fortifications. It is also the seat of the high tribunal for the northern provinces. The quay on the river is built without art; on one side is a street, the other side is walled and raised, though merely for the purpose of making ships' cables fast. From the strand rises a broad well-paved street, with causeways on the sides, leading to an equally handsome oblique street. The other streets along the declivity of the hill are narrow, crooked, and dirty; but upon the hill are many fine, broad, straight streets, with a number of new and handsome houses. All the buildings are regular, light and neat, and this town is allowed to be the cleanest in Portugal. The steep declivity of the hill on which the town is built renders walking and riding on horseback or in carriages more laborious than in Lisbon. On the E. side of the town, houses are built against so steep a part of the declivity over the stream, that they can only be entered by steps cut out of the rock. This inconvenience is compensated in a degree, particularly to a stranger, by their romantic situation, and by the prospect of the opposite bank, with its towns, villages, monasteries, and pine-woods.

At Oporto the manners of the people are very much formed on those of the English, who are here more numerous and considerable, in proportion to the other rich inhabitants, than at Lisbon. They have a kind of Casino in a handsome building, very well regulated, and adapted to bring foreigners together. Not long ago a play-house was erected, which, though ill contrived for hearing, attracts a considerable number of attendants to the exhibition of Portuguese plays, performed by tolerably good actors.

The trade of Oporto, which is well-known to consist

chiefly of wine, has suffered much in consequence of the war; and the harbour is ill adapted to be a station for ships of war, on account of the difficulty of its entrance. Hence French privateers have been almost always hovering within sight of it; and this circumstance has ruined many houses in Oporto. In front of the town the river is very deep; two-masted vessels can come to the town itself, those with three masts within a quarter of a league, and the large Brazil ships unload their cargoes in the road. From a statement made by Link, it appears that the English trade to Oporto far exceeds that of all other nations. The country and walks round Oporto are very pleasant and romantic. The rocks which rise out of the sand towards the mouth of the river render the entrance into the harbour extremely narrow and very dangerous. The sea also is very boisterous on these coasts during the rainy season, and the river very rapid; and the sand which is brought down by the stream more and more choaks the passage. A small fort, called San João de Fez, near which is a small market-town, covers the entrance; besides this, on the coast to the northward, is a bastion on the beach; opposite to which, on the S. side, is also a very small fort, called Santa Catarina, with a few other batteries.

Immediately opposite to Oporto, on the S. bank of the Duero, is the appearance of a town not much smaller than Oporto itself. To the westward, along the declivity of a hill, are several detached houses, forming the market-town of "Gaya," a place remarkable both for its situation and name. Here in former times a place called "Cale," spoken of by the ancients, is said to have stood; but Oporto being afterwards built, as more convenient for ships, by the greater depth of water along that bank, it was called "Portus Cale," or the harbour of Cale, whence was derived "Portugal," and at length *Portugal*. Thus, as it is said, from this place the whole kingdom afterwards received its name. Portus Cale was in process of time called "O Porto," (the harbour,) which name the town of Oporto afterwards received. Advancing to the eastward, we come to a considerable and populous town or villa, called "Villanova do Porto," inhabited by the lower classes of people, whereas the rich more generally live in Oporto itself. Between Villanova and Gaya, on a small plain along the bank of the river, are the immense magazines where wine is kept till it is exported. A monastery on a high, and toward the river, very steep hill, completes the circle of the view to the eastward. It is said that the number of inhabitants at Gaya and Villanova, including the detached houses, reckoned as part of both places, amounts to about 20,000. The mountains along the N. bank consist of granite in rocks: those along the S. bank of stratified granite and mica-slate. Traces every where appear of metallic veins of copper pyrites, malachite, and other metals; and along the S. bank, particularly, a copper-mine might be opened with great prospect of success.

The climate of Oporto is in winter damp and foggy, in consequence of its mountainous and woody situation; whence also the air is cooler than elsewhere, though it seldom freezes. On the contrary, in summer, the heat is great, both in this narrow valley and the town, which is situated on a southern declivity. Here, as well as along the coasts of Portugal, regular winds prevail in summer, *viz.* in the morning the east wind, veering about noon towards the south, and then to the west, from which circumstance navigation receives many advantages. The soil, though well cultivated, is not productive; but oranges are brought from Braga and Barcelos, wine from the Upper Duero, and, in short, all those productions which bear the name of this town are not

grown

grown round it, though they are exported from hence: The gardens round Oporto are beautiful and pleasant, and the plants of the Cape and of New Holland grow in the open air with gooseberries, currants, and other fruits of the colder countries of Europe, which are not seen round Lisbon.

The common people are more superstitious, though not more fanatic, than elsewhere. They are reckoned good-humoured, and thefts and robberies are uncommon. Some instances of assassinations with knives, under the influence of jealousy, occasionally occur. The politeness and friendly disposition of the people are much commended: their language abounds with diminutives to an excess that is often ridiculous. Their dress somewhat differs from that of the southern provinces; wooden shoes being here very common, though not found farther towards the south. Oporto is 49 miles N. of Coimbra. N. lat. $41^{\circ} 11'$. W. long $8^{\circ} 19'$. Link's Travels through Portugal.

OPOS, a word used by the old medical writers to express the juices of plants, whether flowing spontaneously, or by means of incisions. It is used by Hippocrates to express the juice of silphium, which was called simply the juice, by way of eminence, as we call the quinquina bark simply the bark. Others have made it signify the juice of the fig-tree, and the caprificus, which they had in frequent use to curdle their milk.

OPOSSUM, or POSSUM, in *Zoology*. See DIDELPHIS.

OPOTSCHNA, in *Geography*, a town of Bohemia, in the circle of Koniggratz; 15 miles N.E. of Koniggratz.

OPOUN, one of the Navigators' islands, in the South Pacific ocean, situated most easterly as well as most southerly of the whole group: it is also called "Toomanua." S. lat. $14^{\circ} 7'$. W. long. $169^{\circ} 7'$.

OPPA, a river of Silesia, which runs into the Oder; 14 miles S.E. of Troppau.

OPPATOW, a town of Moravia, in the circle of Iglau; 14 miles S. of Iglau.

OPPAU. See TROPPEAU.

OPPEAN, a town of Italy, in the department of Benaco; 13 miles S. of Verona.

OPPELN, a principality of Silesia, bounded N. by Poland, and the principalities of Breslau, Oels, and Brieg; E. by Poland; S. by the principalities of Ratibor, Jagerndorf, and Troppau; and W. by those of Neisse and Brieg. The soil is generally sandy, and many parts are covered with large heaths and forests. It contains 27 towns and a few villages.—Also, a city of Silesia, and capital of the above-mentioned principality, situated on the Oder, and the see of a bishop: fortified after the ancient manner, and containing two convents, a collegiate church, and a college, which formerly belonged to the Jesuits. The houses are mostly wooden structures, and the inhabitants are Roman Catholics; 45 miles S.E. of Breslau. N. lat. $50^{\circ} 35'$. E. long. $17^{\circ} 58'$.

OPPENAU, a town of Baden; 13 miles E. of Stralsburg.

OPPENHEIM, a town of France, in the department of Mont Tonnerre, and chief place of a canton, in the district of Mayence; formerly imperial. The place contains 1674, and the canton 10,735 inhabitants, in 20 communes. The great parish church belongs to the Calvinists, but the Lutherans and Roman Catholics have each their churches. At this place is a good growth of wine; 9 miles S.E. of Mentz. N. lat. $49^{\circ} 51'$. E. long. $8^{\circ} 20'$.

OPPIAN, in *Biography*, a Greek poet and grammarian, VOL. XXX.

was a native of Anazarba in Cilicia, and flourished in the beginning of the third century. He dedicated two poems, entitled "Halieutica," on fishing, and "Cynegetica," on hunting, to the emperor Caracalla; with the latter that sovereign was so much pleased, that he gave the author a piece of gold for each line, hence they obtained the name of the *golden verses*. Both poems have been esteemed by various modern critics, as well for the force and elegance of the descriptions, as for the ingenuity of the thoughts and similes. Oppian likewise composed a work "On Fowling," with some other pieces, which are lost. He died of the plague at the age of thirty, and was honoured by his townsmen with a statue. The best editions of Oppian are those of Ritterhufius, Lugd. B. 1597; of Schneider, Argent. 1776; and of Bellin de Ballu, Argent. 1785, in two volumes octavo.

OPPIDO, in *Geography*, a town of Naples, in Calabria Ultra; the see of a bishop; destroyed by an earthquake in the year 1783; the present town is built three miles from the former, which contained about 3000 inhabitants, 1200 of whom perished on that occasion. The loss of the province, by and in consequence of this calamity, included about 32,000 persons. The town is situated 27 miles N.E. of Reggio. N. lat. $38^{\circ} 18'$. E. long. $16^{\circ} 23'$.—Also, a town of Naples, in Basilicata; five miles S.S.E. of Acerenza.

OPPIDONEON, SINAB, in *Ancient Geography*, a town and colony of Africa, in Mauritania Cæsariensis, where the emperor Claudius formed an establishment of veterans. It was situated on the southern bank of the river Chinalap, N. of the mountains denominated Zalacus.

OPPIDUM NOVUM, a town of Gallia Aquitania, between Beneharnum and Aquæ Convenarum. Anton. Itin.—Also, a town of Africa, in Mauritania Tingitana, between Tremulæ and Ad Novas. Id.

OPPIETO, in *Geography*, a town of the island of Corsica; eight miles N.N.E. of Ajazzo.

OPPIIATION, in *Medicine*, the act of obstructing or stopping up the ducts, or passages of the body, by redundant or peccant humours.

The word is chiefly used for obstructions of the lower belly.

Viscid, heavy foods, difficult of digestion, are oppilative; they do not pass off well, but stop in the mouth of the vessels.

OPPIIATIVE. See DEOPPIIATIVE.

OPPONENS POLLICIS, in *Anatomy*, a muscle of the thumb: it is part of the thenar of Winflow, and the carpo-metacarpian of Dumas. It lies on the first bone of the thumb, immediately under the abductor, and extends from the carpus to the first phalanx of the thumb. It arises from the annular ligament, and from the os trapezium; its fibres are directed obliquely outwards, and terminate in the whole length of the outer edge of the first phalanx of the thumb. It is covered externally by the abductor; and it covers the joint of the thumb with the os trapezium, and the surface of the first phalanx: the flexor brevis lies along its inner edge, and is often very closely connected to it. This muscle draws the first phalanx across the palm, so as to bring the thumb into opposition to the other fingers, as when we grasp a spherical body in one hand, or, in a smaller degree, when we hold a pen, pencil, &c.

OPPONENT, a person who withstands or opposes another. The term is chiefly used in speaking of scholastic or academic disputes or exercises, where a person who opposes a thesis, or impugns it by his objections, is called *opponens*, opponent.

OPPOSER, FOREIGN. See FOREIGN *Opposer*.

OPPOSITES, *OPPOSITA*, among *Logicians*, are such things as differ among themselves; but so as not to differ in like manner from some third.

By which circumstance, *opposites* differ from *disparates*.

The schoolmen reckon four kinds of opposites; *viz.* relatively, contrarily, privatively, and contradictorily opposites.

Either, say they, the opposition is between ens and non ens; if the former, it is either with a dependent ens, which makes a relative opposition, the lowest of all; or an independent one, which is a contrary opposite: if a non ens, it is either with a non ens *secundum quid*, which is privative; or with a non ens simply, which is the highest opposition.

OPPOSITES, *Opposita*, complexly taken, are propositions that clash with each other. As, man is an animal; and man is not an animal.

OPPOSITE Angles. See **ANGLE**.

OPPOSITE Cones denote two similar cones, vertically opposite, that is, having the same common vertex, as well as the same axis. See **CONE**.

OPPOSITE Sections are two hyperbolas made by cutting two opposite cones by the same plane. See **HYPERBOLA**.

OPPOSITION, in *Geometry*, the relation of two things, between which a line may be drawn perpendicular to both.

OPPOSITION, in *Logic*, the quality of disagreement between propositions which have the same subject, and the same attribute.

Opposition is said, by logicians, to be either *complex* or *incomplex*.

Incomplex, or *simple* opposition, is the disagreement of two things, which will not suffer each other to be in the same subject.

Thus heat is opposed to cold, sight to blindness, &c. Which opposition has already been observed to be of four kinds.

Complex opposition is defined, by Aristotle, to be the affirming and denying the same predicate of the same subject, not taken equivocally, but for the same, in the same manner, and at the same time; as, Socrates is learned; and Socrates is not learned.

The later schoolmen, deviating from their master, define opposition an affection of enunciations, whereby two absolute propositions, the same extremes being supposed in the same order and number, and understood without any ambiguity, of the same thing, oppose each other, either in respect of quantity or of quality, or of both. According to the former definition, there are three species of opposition, *contrary*, *subcontrary*, and *contradictory*: according to the second, a fourth species is admitted, *viz.* *subaltern*.

To know how and wherein propositions are opposite, they must be compared, in quantity and quality, all the ways in which they can be compared. If they be opposite both in quality and quantity, *i.e.* if the one be affirmative, and the other negative; the one universal, the other particular; they are said to be contradictory; *v.gr.* no pleasure is allowed; some pleasure is allowed.

If they be only opposite in quality, and not in quantity, they are called *contraries*, if universal; and *subcontraries*, if particular; *v.gr.* all use of wine is evil; no use of wine is evil. Some means of preserving reputation are allowed; some means of preserving reputation are not allowed.

If the propositions be only opposite in quantity, they are called *subalterns*: *v.gr.* every man is liable to sin; some man is liable to sin. But this last is no proper opposition; inasmuch as the universal proposition always includes the particular one.

Single propositions, which can only be opposed in quality, are reducible to contrary ones.

The essential properties of propositions, considered with regard to their opposition; are, 1. That of two contradictory propositions, there is one always true, and another false. 2. Two contradictory propositions can never be both true; but may be both false. 3. Subcontrary propositions may be all true at the same time; as happens when the attribute is accidental to the subject; but when it is essential to it, the one is true, the other false. 4. Subalterns may be either true or false at the same time; or the one may be true, the other false. If the attribute be essential to the subject, the subaltern affirmatives are true, and the negatives false; but if the negatives deny the subject an attribute incompatible with the subject, they will be both true. When the attribute is accidental to the subject, the universal subaltern is ordinarily false, and the particular one true.

OPPOSITION, in *Rhetoric*, denotes a figure, whereby two things are joined together, which appeared incompatible; as when Horace says, a wife folly.

In Bouhours's notion, this figure, which seems to deny what it establishes, and contradicts itself in appearance, is very elegant. See **ANTITHESIS**.

OPPOSITION, in *Astronomy*, is that aspect or situation of two stars or planets, wherein they are diametrically opposite to each other, or 180°, that is, a semicircle, apart.

When the moon is diametrically opposite to the sun, so that she shews her whole illumined face; she is said, with regard to the sun, to be in opposition; and she is then said to be *in her full*, and shines all night long. See **MOON** and **PHASES**.

Eclipses of the moon never happen but when she is in opposition with the sun, and when they both meet in or near the nodes of the ecliptic.

Mars in his opposition to the sun is nearer the earth than he is to the sun.

OPPS, in *Geography*, a village of America, in Northampton county, Pennsylvania; six miles S.E. of Bethlehem.

OPPURG, a town of Saxony, in the circle of Neustadt, which has a citadel, and was formerly fortified with walls and towers; four miles W.S.W. of Neustadt.

OPSA, a town of Lithuania, in the palatinate of Wilna; 12 miles S.S.W. of Braßau.

OPSAL, a town of Norway, in the province of Aggerhuus; 40 miles N. of Konfvinger.

OPSICELLA, in *Ancient Geography*, a town of Spain, in Cantabria; built, according to Strabo, by the companions of Antenor, and named by him.

OPSIUKOVA, a town of Russia, in the government of Novgorod, on the Tchegodo; 80 miles E.N.E. of Novgorod.

OPSLO. See **CHRISTIANIA**.

OPSO, a town of Istria; seven miles E.N.E. of Cape d'Istria.

OPSONOMUS, in *Antiquity*, a magistrate of Athens, of whom there were two or three; chosen out of the senate or council.

Their office was to inspect the fish-market, and to take care that every thing was done in order, and according to the laws.

OPTATIVE, in *Grammar*, the third mood in the conjugations of verbs, serving to express an ardent desire or wish for any thing.

Instead of a particular mood, or a particular set of inflexions to express this desire, the English, Latins, &c. express it by an adverb of wishing prefixed to it. The Latins by

by *utinam*; the French by *plut à Dieu*; and the English by *would to God*, &c.

In these languages, setting aside the adverb, the optative is the same with the subjunctive; the inflexion of the verb, which make what we call the *moods*, being the same in both.

Indeed, in the Greek, the wish is expressed by a particular inflexion, thence called optative; and in the French, Spanish, and Italian, there is something like it; their triple senses serving the same purpose. But the optative mood may be safely retrenched from the Latin and English. See *MOOD*.

OPTERIA, formed from *οπτομαι*, *I see*, among the *Ancients*, presents made to a child the first time a person saw it.

OPTERIA was also used for the presents which the bridegroom made his bride when she was conducted to him; this being the first time he saw her. See *Barthol. de Puerp. vet.*

OPTIC, or **OPTICAL**, something that relates to *vision*, or the sense of seeing. See *VISION*.

OPTIC Angle. See *ANGLE*.

OPTIC Axis. See *AXIS*.

OPTIC Chamber. See *CAMERA Obscura*.

OPTIC Glasses, are glasses ground either concave or convex; so as either to collect or disperse the rays of light; by means of which vision is improved, and the eye strengthened, preserved, &c.

For the manner of grinding and polishing optic glasses; see *GRINDING, POLISHING, GLASS, &c.* For their phenomena, see *LENS, MIRROR, &c.*

The principal among optic glasses are telescopes, microscopes, spectacles, reading glasses, magic lanterns, &c. See the construction and use of each under its proper article, *TELESCOPE, MICROSCOPE, SPECTACLE, MAGIC Lantern, &c.*

OPTIC, or **Optical Inequality**, in *Astronomy*, is an apparent irregularity in the motions of far distant bodies; so called, because not really in the moving bodies, but arising from the situation of the spectator's eye; so that if the eye were in the centre, it would always see the motions uniform.

The optical inequality may be thus illustrated: suppose a body revolving in the periphery of a circle *ABDEFGQP* (*Plate XV. Optics, fig. 22.*) and moving through equal arcs *AB*, *BD*, *DE*, *EF*, in equal times; and suppose the eye in the plane of the same circle, but at a distance from it, viewing the motion of the body from *O*: when the body goes from *A* to *B*, its apparent motion is measured by the angle *AOB*, or the arc *HL*, which it will seem to describe. But in an equal time, while it moves through the arc *BD*, its apparent motion will be determined by the angle *BOD*, or the arc *LM*, which is less than the former arc *HL*. And when arrived at *D*, it will be seen at the point *M* of the line *NLM*. But it spends the same time in describing *DE*, as it does in *AB* or *BD*; and when arrived at *E*, it is still seen at *M*; appearing stationary in all the space from *D* to *E*. When it arrives at *F*, the eye will see it in *L*; and at *G*, it will appear at *H*; so it will seem to have gone retrograde: and, lastly, from *Q* to *P*, it will again appear stationary.

OPTIC Nerves, in *Anatomy*, the second pair of nerves, springing from the crura of the medulla oblongata, and passing thence to the eye. See *NERVOUS System*. See also *VISION*.

OPTIC Nerves, *Diminished Sensibility of*. See *GUTTA Serena*.

OPTIC Pencil. See *PENCIL of Rays*.

OPTIC Place of a star, &c. See *PLACE*.

OPTIC Pyramid, in *Perspective*, is the pyramid whose base is the visible object, and its vertex in the eye; formed by rays drawn from the several points of the perimeter to the eye.

Hence also may appear what is meant by *optic triangle*.

OPTIC Rays are particularly used for those with which an optic pyramid, or optic triangle, is terminated.

OPTICS, **OPTICA**, is properly the science of direct *vision*; which see.

OPTICS is also used, in a larger sense, for the science of vision, or visibles in general.

In which sense, optics includes *catoptrics*, and *dioptrics*: and even *perspective*; which see respectively.

OPTICS, in its more extensive acceptance, is a mixed mathematical science, which explains the manner by which vision is performed in the eye; treats of sight in the general; gives the reasons of the several modifications or alterations which the rays of light undergo in the eye; and shews why objects appear sometimes greater, sometimes smaller, sometimes more distinct, sometimes more confused, sometimes nearer, and sometimes more remote. In this extensive signification, it is considered by sir Isaac Newton in his admirable work called "*Optics*."

Optics makes a considerable branch of natural philosophy; both as it explains the laws of nature, according to which vision is performed; and as it accounts for abundance of physical phenomena, otherwise inexplicable. For what can be determined about light, colours, transparency, opacity, meteors, the rainbow, parhelia, &c. but on the principles of optics? What about the nature of the stars? The structure of the mundane system? The motions of the planets? The eclipses of the luminaries? &c. **Optics**, therefore, makes a considerable part of astronomy.

It was the opinion of Pythagoras, that vision is caused by particles continually flying from the surfaces of bodies, and entering the pupil of the eye: whereas Empedocles and Plato supposed, that the cause of vision is something emitted from the eye, which meeting with something else that proceeds from the object, is thereby reflected back again. But though the Platonic philosophers were mistaken as to the progress of vision, they were acquainted with two very important and fundamental principles of this science; *viz.* that light, from whatsoever it proceeds, is propagated in right lines, differing in this respect from sound; and that when it is reflected from the surfaces of polished bodies, the angle of incidence is equal to the angle of reflection.

Aristotle, amidst the variety of other objects that engaged his attention, did not overlook the science of optics, though many of his observations were fanciful and erroneous. Thus we find, that he maintained, in opposition to Empedocles, that light is incorporeal; conceiving that if it were not a mere quality, but a real substance, the motion of it could not be insensible, in passing from the east to the west, though it might escape our notice in a smaller distance. His remarks on the rainbow, halos, and other phenomena of a similar nature, which were classed by the ancients under the denomination of meteors, though, in some respects, blended with error, are nevertheless, in other respects, just and true, and have led to a more unexceptionable and philosophical account of the causes that produce them, and the various circumstances that attend them. Indeed, the knowledge of the ancients in this department of science was very imperfect and limited; though they seem to have been acquainted with the refraction as well as the reflexion of light. It appears, that the ancient geometricians contented them-

selves with deducing a system of optics from the two principles above-mentioned: and the treatise of optics, which has been ascribed to Euclid, is employed about determining the apparent size and figure of objects from the angle under which they appear, or which the extremities of them subtend at the eye, and the apparent place of the image of an object reflected from a polished mirror; which he fixes at the place where the reflected ray meets a perpendicular to the mirror drawn through the object. But this work of the ancient mathematician is so imperfect, and so inaccurate, that most persons have hesitated in ascribing it to this celebrated author. The latter part of Euclid's work is employed in investigating the phenomena of plane, convex, and concave mirrors. The magnifying power of concave mirrors is mentioned both by Seneca and Pliny. The effects of burning-glasses were observed by the ancients; and the power of concave mirrors in this respect is taken notice of by Euclid in the treatise we have mentioned. It has been said, and very generally allowed, that Archimedes wrote a treatise on the subject of burning mirrors, though it be not now extant. From the time of Euclid to Seneca, who repeats the crude sentiments of Aristotle, together with some of his own, concerning the rainbow, we find nothing worthy of being particularly detailed on the subject of optics. Ptolemy, who lived 150 years after Christ, wrote a treatise of optics, which is lost; but from the accounts of others it is known, that he treated of astronomical refractions. After Ptolemy there occurs a great chasm in the history of optics, as well as other branches of mathematics and philosophy, which were cultivated chiefly by the Arabs during the dark ages of Europe. The first Arabian writer of optics, of whom we have any account, is Al Farabi, who flourished 900 years after Christ, but of his work we know nothing. The treatise of Ebn Haithem, who in the year 1000 wrote more largely on this subject, and who treated distinctly of direct, reflected, and refracted vision, and also of burning mirrors, is lost. The only work of the Arabian philosophers that remains is that of Alhazen, who flourished in the 12th century; and his treatise of optics is well worthy of attention. He gives a tolerable description of the eye, and discourses largely concerning the nature of vision, maintaining that the crystalline humour of the eye is of principal use for this purpose, without considering it as a lens, and asserting that vision is not completed, till the ideas of external objects are conveyed by the optic nerves to the brain. He accounts for single vision by two eyes, by supposing that when two corresponding parts of the retina are affected, the mind perceives but one image: and he treats much at large of optical deceptions both in direct vision, and also in vision by reflected and refracted light. Alhazen also inquired concerning the nature of refraction more than any of the ancient writers; and from astronomical observations he deduced several properties of atmospheric refraction: first of all advancing, that the stars are sometimes seen above the horizon by means of refraction, when they are really below it. This observation was confirmed by Vitellio, B. Waltherus, and Tycho Brahe. Alhazen also observed, that refraction contracts the diameters and distances of the heavenly bodies, and that it is the cause of the twinkling of the stars: though it is probable that neither he nor Vitellio knew any thing of its just quantity. About the year 1500, great attention was paid to this subject by Bernard Walthar, Mæstlin, and others, but chiefly by Tycho Brahe. Vitellio, a native of Poland, illustrated Alhazen's optics, in a treatise published in 1270. This work contains every thing valuable in that of Alhazen,

and it is digested in a much more methodical and intelligible manner. He notices the light that is lost by reflection and refraction, by reason of which all objects appear less luminous. The result of his experiments on the refractive powers of air, water, and glass, corresponding to different angles of incidence, he reduced into a table. In his account of the horizontal moon, he agrees with Alhazen, observing, that, in the horizon, the sky seems to touch the earth, and appears much more distant from us than in the zenith, on account of the intermediate space containing a greater variety of objects upon the visible surface of the earth. He ascribes the twinkling of the stars to the motion of the air, in which the light is refracted; and he shews that refraction, as well as reflection, is necessary to form the rainbow. He defines the colours of the rainbow to be three, and makes many other observations on its phenomena. Vitellio attempts to explain refraction, or to ascertain the law of it, and he considers the foci of glass spheres, and the apparent size of objects seen through them; but Montucla says, that he is not at all accurate upon any of these subjects. Ten years after the publication of Vitellio's work, Peccam, archbishop of Canterbury, wrote a treatise of direct optics, which was then called perspective; but without making any addition to the existing stock of optical knowledge. His treatise is said to be concise and judicious, and to contain, among other things, a very clear and distinct account of the reason why the sky near the horizon appears more distant from us than at any other place. As contemporary with Vitellio and Peccam, was Roger Bacon, who frequently quotes Alhazen on the subject of optics, and who does not seem, as far as respects the theory of optics, to have much improved on the Arabian writer. From the writings of Alhazen, and Bacon's observations and experiments, some monks, it is probable, gradually succeeded in the construction of spectacles. The use of concave as well as convex glasses for the assistance of vision, whoever might have first suggested it, was particularly explained by Maurolycus. Bacon made approaches, to say the least of them, towards the discovery and actual construction of telescopes and microscopes. To Maurolycus, teacher of mathematics at Messina, we are indebted for some capital improvements in the science of optics. This writer, in his treatise "*De Lumine et Umbra*," published in 1575, demonstrates that the crystalline humour of the eye is a lens, that collects the rays of light that issue from external objects, and throws them upon the retina, in which is the focus of each pencil: and hence he was led to discover the reason why some persons are short-sighted and others long-sighted; and why the former are relieved by concave glasses, and the latter by those that are convex. But he does not seem to have found, that the rays of light issuing, in pencils, from every point of an object, make a real image of it upon the retina. About the same time that Maurolycus made such great advances towards the discovery of the nature of vision, Johannes Baptista Porta, of Naples, invented the camera obscura, an account of which he published in his "*Magia Naturalis*," about the year 1560, when he was not quite fifteen years old. This work was republished thirty years after, with great enlargements. On its first publication, it was immediately translated into Italian, French, Spanish, and Arabic, and passed through many editions in various countries. Porta's discovery suggested a hint to Kircher, of which he availed himself by the construction of the magic lantern, doing that in the night, and in many respects more conveniently, which Porta exhibited in the day. Notwithstanding Porta's experiments with the camera obscura, and several just conclusions which he deduced from them, he erroneously conceived that the crystalline humour received the

the images of objects; and Kepler was the person, who, in 1604, first observed that the retina is the tablet on which the images of external objects are depicted. Kircher's discoveries are contained in his work entitled "*Ars magna Lucis et Umræ*." But our limits will not allow our particularizing more, either of his or of Porta's improvements in optics. Referring to the article RAINBOW an historical account of observations relating to this phenomenon by Maurolycus, B. Porta, Fletcher of Breslau, and Antonio de Dominis, and to the articles TELESCOPES and MICROSCOPES the discoveries relating to these instruments, we shall proceed to consider the services done to the science of optics by the famous John Kepler. He not only explained the rationale of the telescope which he found in use, but pointed out methods of constructing others of superior powers, and more commodious application. To him we are principally indebted for an explanation of the doctrine of refraction through mediums of different forms, though something of this kind had previously been done by Maurolycus; and thus he led the way to the illustration of the rationale of telescopes and microscopes. Besides the doctrine of lenses, and the rationale of telescopes, &c. depending upon it, we are indebted to Kepler for his attention to several other branches of optical science, particularly the business of refraction, and the nature of vision. The same age that produced Kepler was still more distinguished by Galileo, who threw new light upon almost every subject of philosophical inquiry. Besides the part he took in the construction and use of telescopes, which we shall more particularly notice under that article, he first conceived the thought of measuring the velocity of light, and he gives a particular description of his contrivance for this purpose in his treatise on mechanics.

Although Des Cartes was very eminent in the science of optics, he does not stand single in the period at which he lived. Besides Snellius, who led the way to the discovery of the great law of refraction, he had other illustrious contemporaries; particularly the famous Scheiner, a Jesuit, who died in the same year with Des Cartes. He carried into execution the schemes of Kepler, for constructing telescopes upon plans different from that of the original or Galilean one; and shares with Galileo the merit of discovering the spots of the sun. His treatise entitled "*Oculus*" is very valuable, and abounds with ingenious and important illustrations of the nature of vision. Gassendi, also a contemporary of Des Cartes, wrote largely on the subject of light, and the natural phenomena which depend upon it; but he adhered closely to the system of Epicurus, in opposition to that of Aristotle, maintaining the materiality of light, and asserting that bodies are visible by means of particles continually detaching themselves from their surfaces. Gassendi, however, made no particular discovery in optics: and he is to be ranked rather among the schoolmen than the philosophers. Du Hamel, the first secretary to the Royal Academy of Sciences at Paris, in his "*Astronomia Physica*," published in 1681, examined the opinions of Epicurus, as defended by Gassendi, and the Cartesian hypothesis; and after a laboured refutation of them both, pleads strongly in favour of the Aristotelian doctrine of light. We might here also mention Aguilonius, a Jesuit of Brussels, who published a large treatise on optics in 1613. But Athanasius Kircher, who was one of the ablest philosophers and mathematicians of the age in which he lived, merits peculiar notice. He was about the same age with Des Cartes, but outlived him thirty years. His large and magnificent work, already mentioned, and entitled "*Ars magna Lucis et Umræ*," must, at the time in which it is written, have been considered as a very capital per-

formance; and though this author discovered no new property of light, he contributed very much to the extension and improvement of the science of optics. Kircher took great pains in forming, from natural experiments, a table of the angles of refraction, corresponding to any given angle of incidence, even to a minute of a degree, with respect to air and water; and he observed the degrees with regard to wine, oil, and glass. This table is contained in the work already cited. At length the discovery of the true law of refraction was made, in part, by Willebrod Snellius, professor of mathematics at Leyden. He did not live to publish it himself, but it was communicated to several persons before it appeared in the writings of Des Cartes, who published it under a different form, without acknowledging his obligations to Snellius, whose papers, as Huygens assures us, from his own knowledge, Des Cartes had seen. Snellius was led to the important discovery, not by any reasoning *à priori*, but by experiments. The discovery was, that the co-secants of the angles of incidence and refraction are always in the same ratio; if the medium be air and water, the ratio is 4 to 3, if air and glass, it is 3 to 2 nearly. Des Cartes published this law as the result of his own inquiries into the nature of reflection and refraction. But he gives it under a different form from that of Snellius, and, in general, a more commodious one; for, according to him, the sine of the angle of refraction always bears the same proportion to the sine of the angle of incidence. Des Cartes seems to have been the first person who attempted to explain the cause of refraction, which he did by the resolution of forces, on the principles of mechanics: supposing that light passes with more ease through a dense medium than a rare one. The truth of this explanation was questioned by M. Fermat; who, in opposition to Des Cartes, asserted that light suffers more resistance in water than in air, and more in glass than in water; and he maintained, that the resistance of different mediums, with respect to light, is in proportion to their densities. M. Leibnitz adopted the same general idea: for the result of their mode of reasoning, see REFRACTION. Dechales explained the law of refraction by another hypothesis, which was adopted by Dr. Barrow, if he was not the author of it: for an account of this also we refer to REFRACTION.

One of the most considerable improvements in optical knowledge made by Des Cartes was his explication of the rainbow; which see. Scheiner made several important observations relating to vision at this period; completing the discovery that vision is performed by means of the images of external objects upon the retina. By cutting away the coats of the back part of the eyes of sheep and oxen, and presenting several objects before them, within the usual distance of vision, he saw their images distinctly and beautifully painted upon the naked retina. He did the same with the human eye; and exhibited this curious experiment at Rome in the year 1625. Scheiner particularly notices the correspondence between the eye and the camera obscura, and explains a variety of methods to make the images of objects erect. As to the images of objects being inverted in the eye, he acquiesces in the reason for it assigned by Kepler, *viz.* that the mind traces the progress of the rays to the pupil, and refers them to that part of the object from which they, at that place, seemed to have proceeded. That the pupil of the eye is enlarged, in order to view remote objects, and that it is contracted while we are viewing those that are near, is a fact with which Scheiner was well acquainted, and which he proved by experiments, and illustrated by figures. Scheiner took considerable pains in ascertaining the density and refractive power of all the humours of the eye; and concludes, that the aqueous humour does not differ much

from water in this respect, nor the crystalline from glass, and that the vitreous humour is a medium between them both. He also traced the progress of the rays of light through all the humours of the eye, and after discussing every hypothesis concerning the seat of vision, demonstrates that it is the retina, shewing that this was the opinion of Alhazen, Vitellio, Kepler, and all the most eminent philosophers. Des Cartes well explains the natural methods of judging of the magnitudes, situations, and distances of objects by the direction of the optic axes; comparing it to a blind man's judging of the distance and size of an object, by feeling at it with two sticks of a known length, when the hands in which he holds them are at a known distance from each other. Under the article VISION we shall mention some other observations of this ingenious philosopher that pertain to this subject.

Some time before the age of Des Cartes, and also during his time, philosophers began to speculate concerning the possibility of what Archimedes is said to have effected with burning mirrors, in destroying the fleet of Marcellus; and observing that the focal distance of concave speculums was much too small for the purpose, the story was discredited, and rejected as a fable, particularly by Des Cartes. Kircher, and his pupil Schottus, however, thought the subject worthy of a more particular investigation, especially as Proclus is said to have destroyed a fleet at Constantinople by the same means. Kircher, with a view of terminating the dispute, made a number of experiments; and at length determined to try the effect of many plane mirrors. Accordingly he erected a frame, on which he placed five of these mirrors, of the same size, and so disposed as to throw the rays that were reflected from them, upon the same place, at the distance of more than 100 feet; and these five mirrors produced so great a degree of heat, that he had no doubt but that, by multiplying them, he could have set fire to inflammable substances at a greater distance. A drawing of this machine may be seen in Kircher's "*Ars magna Lucis et Umbræ*." Intent upon this subject, Scheiner, after many trials, made a voyage to Syracuse, in company with Scottus, to take a view of the place and of the supposed transaction; and they both concluded that the galleys of Marcellus could not have been more than 30 paces from Archimedes. See BURNING GLASSES.

The controversy concerning the nature of light was revived at this period by the hypothesis of Des Cartes, who maintained that light is neither a substance, as Epicurus and some others had supposed, nor yet a mere property of bodies, as Aristotle conceived; but the motion of a subtle fluid, communicated instantaneously by the pressure of a luminous body. Instead of the perfectly solid globules, in the motion of which Des Cartes thought that light consisted, Malebranche substituted fluid vortices, and supposed that every impression communicated to any one of them is immediately transmitted to those that are contiguous to it, so that the propagation of light is similar to that of sound. The later Cartesians in general supposed, that the fluid by which light is transmitted is elastic, and M. Huygens further modified the Cartesian hypothesis, imagining the waves of light to spread, not circularly, but in ellipses; and upon this supposition he endeavoured to explain the phenomena of Island crystal. Des Cartes was embarrassed by his hypothesis concerning light in forming his ideas concerning colours. He advanced that light is affected by two kinds of motion, direct and circular. When the circular motion is quicker than the direct, the colour, he says, is red; if the direct be quicker, it is blue; but if they be equal, it is yellow; and out of these three colours it was long the opinion of many philosophers, that all the rest were formed, by dif-

ferent proportions in their mixture. Notwithstanding this embarrassment and error with respect to the nature of light, and colours, he justly distinguishes between black and white; observing that the former suffocates, or extinguishes the rays that fall upon it; whereas the latter reflects them. Kepler thought that black objects became hot sooner than white ones, because the former are of a more dry and inflammable nature. While Kircher was at Rome in 1639, he had an opportunity of examining a report that was current concerning theameleon; viz. that it could assume the colour of any object near which it was placed, except those that were white or red; he found that there was no grounds for the exception of these two colours; this power he ascribes to the imagination of the animal, as it loses it when it is dead. Kircher was the first who observed the remarkable properties of the infusion of *lignum nephriticum*, the optical phenomena of which have been the subject of various discussion from his time to that of sir Isaac Newton, who first explained them satisfactorily. In the subsequent period, several philosophical societies were formed, which very much contributed to the improvement of optics, as well as other sciences. The persons who distinguished themselves at this time were Dr. Hooke, secretary to the Royal Society, father Grimaldi in Italy, De la Hire, M. Mariotte, M. Perrat, among the French, and particularly M. Huygens, who composed a treatise of Dioptrics, of which Newton always professed a very high opinion. Otho Guericke and father Cherubin also deserve mention. The greatest discovery that was made during the period to which we have now advanced in the history of optics was the velocity with which light is transmitted. Galileo attempted to measure it, but failed; the academy del Cimento pursued the subject according to the mode proposed by Galileo; need we be surprised at their want of success? At length the object was accomplished by Roemer. (See LIGHT.) The honourable Mr. Boyle made a variety of experiments in order to discover the first principles and causes of colours, and the constitution of bodies on which they depend; but the enumeration of them would require a detail, for which we have not room. The facts concerning *lignum nephriticum*, suggested by Kircher, were fully ascertained by Mr. Boyle, who also corrected several of the hasty observations of Kircher concerning the colours that appear in the infusion of this substance. In this tincture he observed the difference between reflected and transmitted light. The principal phenomena of this infusion are easily explained by the Newtonian doctrine of the different refrangibility and reflexivity of the rays of light, and the disposition of particular bodies to reflect some kinds of rays and to transmit others; so that if the reflected light fall upon the eye, they shall appear to be of one colour, when by the transmitted light they appear to be of another. The first distinct account of the colours exhibited by thin plates, of various substances, occurs among the observations of Mr. Boyle. The subject was pursued by Dr. Hooke; and he was the first to observe, if not to describe, the beautiful colours that appear in thin plates of Muscovy glass. Mr. Hauksbee about this time made many experiments by means of a prism for ascertaining the refractive powers of different fluids; and he drew up a table that exhibited their specific gravities, the angles at which they were observed, and the ratio of refraction. Dr. Hooke first suggested the idea of making allowance for the effect of the refraction of light in passing from the higher and rarer, to the lower and denser region of the atmosphere, in the computed height of mountains; and thus he accounts for the difference among authors with regard to the height of several very high hills. For an account of the discovery of the *inflection* of light we refer

refer to that article, and for the seat of vision, &c. to CHOROIDES, EYES, RETINA, and VISION.

The first persons who distinguished themselves in grinding telescopic glasses were two Italians, *viz.* Eustachio Divini at Rome, and Campani, of superior fame, at Bologna. For the history of the invention and improvements of the refracting and reflecting telescopes, and microscopes, see TELESCOPE and MICROSCOPE. Of all the discoveries that have been made at any time, concerning the nature of light and colour, those of sir Isaac Newton are pre-eminent, and they are comprised in his "Optics." The principal of them were communicated to the Royal Society, seven or eight years after they were made, in a letter to the secretary Mr. Oldenburgh, dated Cambridge, Jan. 18. 1672. (See COLOUR and REFRACTIBILITY.) See also REFRACTION and REFLEXION. Sir Isaac Newton's improvement of telescopes will appear under that article. The observations that were made in reference to the Bolognian phosphorus will be detailed under PHOSPHORUS, &c. and the conclusions deduced from them with regard to the materiality of light will be found under LIGHT, &c. The velocity of light, first ascertained by Roemer, was farther investigated by Dr. Bradley and Mr. Molyneux, in 1725. (See LIGHT.) At and after this period the science of optics received great improvements from the observations and experiments of Mr. Melville, the marquis de Courtivron, M. Boscovich, M. Clairaut, M. Muschenbroeck, M. Bouguer, M. Buffon, the Abbé Mazeas, Melville, M. Du Tour, M. Euler, Mr. Dollond, the duke de Chaulnes, Mr. Lambert, Mr. Canton, M. de la Hire, Dr. Porterfield, Dr. Jurin, Dr. Motte of Dantzic, bishop Berkeley, Dr. Barrow, Mr. Robins, Dr. Smith, Delaval, Mr. Michell, &c. &c.; but our limits will not allow our particularly enumerating them in this place; and it is the less necessary to do it, as they occur under appropriate articles in various parts of the Cyclopædia.

We shall close this article with observing that we have an excellent and comprehensive work on Optics, by Dr. Smith, 4to.; another by Mr. Harris, 4to.; and an elaborate History of the present State of Discoveries relating to Vision, Light, and Colours, by Dr. Priestley, 4to. 1772.

But as the science of optics constitutes a very distinguishing branch of natural philosophy, we have treatises of optics in every comprehensive system of philosophy; so that it would be endless to enumerate the various writers on this subject.

From optics likewise arises perspective, all the rules of which have their foundation in optics. Indeed Tacquet makes perspective a part of optics; though John, archbishop of Canterbury, in his "Perspectiva Communis," calls optics, catoptrics, and dioptrics, by the name *perspective*.

This art, for so it should be considered rather than as a science, was revived, or re-invented, in the 16th century. It owes its birth to painting, and particularly to that branch of it which was employed in the decoration of the theatre. Vitruvius informs us, that Agatharchus, instructed by Æschylus, was the first who wrote upon this subject; and that afterwards the principles of this art were more distinctly taught by Democritus and Anaxagoras, the disciples of Agatharchus. How they described the theory of this art we are not informed, as their writings have been lost: however, the revival of painting in Italy was accompanied with a revival of this art; and the first person who attempted to lay down the rules of perspective was Pietro del Borgo, an Italian. He supposed objects to be placed beyond a transparent tablet, and endeavoured to trace the images, which rays of light, emitted from them, would make upon

it. The book, which he wrote upon this subject, is not now extant; and this is the more to be regretted, as it is very much commended by the famous Egnazio Dante. Upon the principles of Borgo, Albert Durer constructed a machine, by which he could trace the perspective appearance of objects. Balthazar Parussi, having studied the writings of Borgo, endeavoured to make them more intelligible. To him we owe the discovery of points of distance, to which all lines that make an angle of 45° with the ground line are drawn. Soon after, Guido Ubaldi, another Italian, found that all the lines, which are parallel to one another, and to the horizon, if they be inclined to the ground line, converge to some point in the horizontal line; and that through this point, also, a line drawn from the eye, parallel to them, will pass. These principles combined enabled him to make out a pretty complete theory of perspective. Great improvements were made in the rules of perspective by subsequent geometricians, particularly by professor Gravesande, and still more by Dr. Brook Taylor, whose principles are, in a great measure, new, and much more general than those of any person before him. Although Dr. Taylor really invented his excellent method of perspective, yet it is suggested by Mr. Robins, that the same method was published by Guido Ubaldi, in his "Perspective," printed at Pesaro, in 1600. In this treatise, the method is delivered very clearly, and confirmed by most excellent demonstrations. In the last book, Ubaldi applies his method to the delineation of the scenes of a theatre; and in this, as far as the practice is concerned, he is followed by signor Sabatellini, in his "Practica di fabricar Scene," of which there was a new edition at Ravenna in 1638; and to this was added a second book, containing a description of the machines used for producing the sudden changes in the decorations of the stage. We are indebted to the opticians of a much later period for ingenious devices to apply the knowledge they had of optics, and especially of perspective, to the purposes of amusement. See ANAMORPHOSIS.

The principles and practice of *perspective* will be illustrated at large under that article.

OPTIMATES, in *Antiquity*, one of the divisions of the Roman people, opposed to *populares*.

According to Tully's description, the optimates were the best citizens, or those who desired their actions might be approved by the better sort; and the populares those, who, out of a thirst of vain-glory, did not so much consider what was right, as what would please the populace, and get an interest in them.

Others rather make the optimates to be the vigorous assertors of the dignity of the chief magistrate, and the sticklers for the grandeur of the state; who cared not if the inferior members suffered, if it were for the advancement of the commanding powers; and the populares, those who courted the favour of the populace, and encouraged them to demand larger privileges, to bring matters nearer to a level.

OPTIO, among the Romans, an assistant or lieutenant belonging to every centurion.

They were called *optiones*, from *opto*, *I choose*; because it was in the option of the centurion to choose whom he pleased for this employment; though at first it was otherwise, the optio being chosen by the tribune or chief commander of the legion.

The optiones were not peculiar to the camp, but were used also in many other offices of life.

OPTION, the power or faculty of wishing, or choosing; or the choice a person makes of any thing.

When a new suffragan bishop, whether created or transferred,

lated, is confirmed, the archbishop of the province, by a customary prerogative, claims the collation of the first vacant benefice, or dignity, in that see, according as he shall choose; which choice is called the archbishop's option.

Ever since archbishop Cranmer's time, the mode hath been to convey the advowson, either of the first dignity or benefice that should fall, or of some one certain, to the archbishop, his executors, or assigns, at first for 21 years, and afterwards for the next avoidance.

But in case the bishop dies, or is translated, before the present incumbent of the promotion chosen by the archbishop shall die or be removed, it is generally supposed that the option is void; inasmuch as the granter, singly and by himself, could not convey any right or title beyond the term of his continuance in that see. And if the archbishop dies before the avoidance shall happen, the right of filling up the vacancy shall go to his executors or administrators.

OPTO-KILTEKAI, in *Geography*, a town of Chinese Tartary. N. lat. $44^{\circ} 8'$. E. long. $92^{\circ} 54'$.

OPTOMETER, an instrument invented by Dr. Porterfield, and so named by him from its use in measuring the limits of distinct vision, and in determining with great exactness the strength and weakness of sight. See his "Treatise on the Eye," vol. i. p. 423. The principles of its construction have also been explained by Dr. Thomas Young, and an improved instrument for the same purpose has been described by him, in the *Phil. Trans.* vol. xci. part i. p. 34, &c. Let an obstacle be interposed between a radiant point R (*Plate XVII. Optics, fig. 1.*) and any refracting surface, or lens CD, and let this obstacle be perforated at two points, A and B, only. Let the refracted rays be intercepted by a plane, so as to form an image on it. Then it is evident, that when this plane, EF, passes through the focus of refracted rays, the image formed on it will be a single point. But if the plane be advanced forwards to GH, or removed backwards to IK, the small pencils, passing through the perforations, will no longer meet in a single point, but will fall on two distinct spots of the plane, G, H, I, K; and, in either case, form a double image of the object. Let us now add two more radiating points, S and T (*fig. 2.*); the one nearer to the lens than the first point, the other more remote; and when the plane, which receives the images, passes through the focus of rays coming from the first point, the images of the second and third points must both be double (*ss, tt*); since the plane, EF, is without the focal distance of rays coming from the farthest point, and within that of rays coming from the nearest. Upon this principle Dr. Porterfield's optometer was founded. But if the three points be supposed to be joined by a line, and this line to be somewhat inclined to the axis of the lens, each point of the line, except the first point R (*fig. 3.*), will have a double image; and each pair of images, being contiguous to those of the neighbouring radiant points, will form with them two continued lines, and the images being more widely separated as the point which they represent is farther from the first radiant point, the lines, *st, st*, will converge on each side towards *r*, the image of this point, and there will intersect each other. The same happens when we look at any object through two pin-holes, within the limits of the pupil. If the object be at the point of perfect vision, the image on the retina will

be single; but in every other case, the image being double, we shall appear to see a double object: and if we look at a line pointed nearly to the eye, it will appear as two lines, crossing each other in the point of perfect vision. For this purpose, the holes may be converted into slits, which render the images nearly as distinct, at the same time that they admit more light. The number may be increased from two to four, or more, whenever particular investigations render it necessary.

The optometer may be made of a slip of card-paper, or of ivory, about eight inches in length, and one in breadth, divided longitudinally by a black line, which must not be too strong. The end of the card must be cut, as is shewn in *fig. 4.*, in order that it may be turned up, and fixed in an inclined position by means of the shoulders; or a detached piece, nearly of this form, may be applied to the optometer, as it is here engraved. A hole about half an inch square must be made in this part; and the sides so cut as to receive a slider of thick paper, with slits of different sizes, from a 40th to a 10th of an inch in breadth, divided by spaces somewhat broader; so that each observer may choose that which best suits the aperture of his pupil. In order to adapt the instrument to the use of presbyopic eyes, the other end must be furnished with a lens of four inches focal length; and a scale must be made near the line on each side of it, divided from one end into inches, and from the other according to the table annexed; by means of which, not only diverging, but also parallel and converging rays from the lens are referred to their virtual focus. The instrument is easily applicable to the purpose of ascertaining the focal length of spectacles required for myopic or presbyopic eyes. Our author, having been furnished by Mr. Cary with the numbers and focal lengths of the glasses commonly made, calculated the distances at which these numbers must be placed on the scale of the optometer, so that a presbyopic eye may be enabled to see at eight inches distance, by using the glasses of the focal length placed opposite to the nearest crossing of the lines; and a myopic eye with parallel rays, by using the glasses indicated by the number that stands opposite their farthest crossing. To facilitate the observations, these numbers are placed opposite that point which will be the nearest crossing to myopic eyes; but this, upon the arbitrary supposition of an equal capability of change of focus in every eye, which is often far from the truth. It cannot be expected, that every person, on the first trial, will fix precisely upon that focus which best suits the defect of his sight. Few can bring their eyes at pleasure to the state of full action, or of perfect relaxation; and a power, two or three degrees lower than that which is thus ascertained, will be found sufficient for ordinary purposes. To the second table are added such numbers as will point out the spectacles necessary for a presbyopic eye, to see at 12 and at 18 inches respectively: the middle series will perhaps be the most proper for placing the numbers on the scale. The optometer should be applied to each eye; and, at the time of observing, the opposite eye should not be shut, but the instrument should be screened from its view. The place of intersection may be accurately ascertained, by means of an index sliding along the scale. The optometer is represented in *figs. 5* and *6*; and the manner in which the lines appear in *fig. 7*.

TABLE I. For extending the Scale by a Lens of four Inches Focus.

4	2.00	11	2.93	30	3.52	200	3.92	— 35	4.51	— 12	6.00
5	2.22	12	3.00	40	3.64	∞	4.00	— 30	4.62	— 11	6.29
6	2.40	13	3.06	50	3.70	— 200	4.08	— 25	4.76	— 10	6.67
7	2.55	14	3.11	60	3.75	— 100	4.17	— 20	5.00	— 9.5	6.90
8	2.67	15	3.16	70	3.78	— 50	4.35	— 15	5.45	— 9.0	7.20
9	2.77	20	3.33	80	3.81	— 45	4.39	— 14	5.60	— 8.5	7.56
10	2.86	25	3.45	100	3.85	— 40	4.44	— 13	5.78	— 8.0	8.00

TABLE II. For placing the Numbers indicating the focal Length of Convex Glasses.

Foc.	VIII.	XII.	XVIII.	Foc.	VIII.	XII.	XVIII.	Foc.	VIII.	XII.	XVIII.
0	8.00	12.00	18.00	20	13.33	30.00	180.00	8	∞	— 24.00	— 14.40
40	10.00	17.14	32.73	18	14.40	36.00	∞	7	— 56.00	— 16.80	— 11.45
36	10.28	18.00	36.00	16	16.00	48.00	— 144.00	6	— 24.00	— 12.00	— 9.00
30	10.91	20.00	45.00	14	18.67	84.00	— 63.00	5	— 13.33	— 8.57	— 5.92
28	11.20	21.00	50.40	12	24.00	∞	— 36.00	4.5	— 10.29	— 7.20	— 6.00
26	11.56	22.29	58.50	11	29.33	— 132.00	— 28.29	4.0	— 8.00	— 6.00	— 5.14
24	12.00	24.00	72.00	10	40.00	— 60.00	— 22.50	3.5	— 6.22	— 4.54	— 4.34
22	12.77	26.40	90.00	9	72.00	— 36.00	— 18.00	3.0	— 4.80	— 4.00	— 3.6

TABLE III. For Concave Glasses.

Number.	Focus and furthest Place.	Nearest Place.	Number.	Focus and furthest Place.	Nearest Place.	Number.	Focus and furthest Place.	Nearest Place.
0		4.00	7	8	2.67	14	3.00	1.71
1	24	3.43	8	7	2.54	15	2.75	1.63
2	18	3.27	9	6	2.40	16	2.50	1.94
3	16	3.20	10	5	2.22	17	2.25	1.44
4	12	3.00	11	4.5	2.12	18	2.00	1.33
5	10	2.86	12	4.0	2.00	19	1.75	1.22
6	9	2.77	13	3.5	1.87	20	1.50	1.02

OPUAGO, in *Geography*, a town of America, in Tioga county and state of New York; 15 miles N.W. of New York.

OPULUS, in *Botany*. See VIBURNUM.

OPUNTIA. See CACTUS.

OPUS, in *Geography*, an island of Dalmatia, at the mouth of the Narenza. This island receives from the floods of the Narenza an accession of soil, which makes a difference in height of ten feet, between the Roman times and the present; and yet this island is not every where capable of cultivation, the soil being marshy, and through want of industry and activity undrained. Herbage of all sorts, Indian corn, wheat and olives in particular, succeed wonderfully; and mulberry trees are so luxuriant, that the silk worms by feeding on them yield very fine silk. The vines do not succeed, because they remain for a considerable part of the year under water, especially in the place between the river Narenza and the Norin, opposite to Mercovich, a village well inhabited by healthy labourers and brave people.

OPUTO, a town of New Navarre; 210 miles S.S.E. of Casa Grande.

OQUENDO, a town of Spain, in the province of Alava; five miles S.E. of Orduna.

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OR, or ORE, a lake of Norway, in the province of Aggerhuus; 36 miles N. of Christiania.

OR, in *Heraldry*, yellow, or the colour of gold.

Without this colour, or argent, silver, there can be no good armory.

In the coats of nobles, it is called *topaz*; and in those of sovereign princes, *sol*. It is represented in engravings by small points, or dots, all over the field, or bearing.

It is accounted the symbol of wisdom, temperance, faith, force, constancy, &c.

Toison d'OR. See TOISON.

ORA, in *Antiquity*, was a term equivalent to an ounce; but it has been much debated among our antiquaries, whether the ora, the mention of which so often occurs, was a coin, or only money of account. Dr. Hickes observes, that the mode of reckoning money by marks and oras was never known in England till after the Danish settlements; and by examining the old nummular estimates among the principal Gothic states upon the Baltic, it appears that the ora and solidus were synonymous terms, and that the ora was the eighth part of the mark. From several of the Danish laws, it likewise appears that the Danish ora, derived by corruption from *aureus*, was the same as the Frank solidus of twelve pence.

pence. As a weight, the ora was regarded as the uncia, or unit, by which the Danish mark was divided; and in Domesday book the ora is used for the ounce, or the twelfth part of the nummular Saxon pound, and the fifteenth of the commercial; as a coin, it was an aureus or the Frank solidus of twelve pence. And from the accidental coincidence of the Frank aureus with the eighth part of their mark, the Danes probably took occasion to give it the new name of ora. There was another ora, mentioned in the rolls of the 27th of Henry III. the value of which was sixteen pence; and this was probably derived from the half mancus of the Saxons. Such, in all appearance, was the original of these two oras; as there were no aurei of that period, to which these two denominations of money of sixteen and twelve pence can possibly be ascribed. It is observed farther, that the name ora distinguishes the gold coins in several parts of Europe to this day. The Portuguese moidore is nothing else but *moeda d'oro*, from the Latin *moneta de auro*: the French *Louis d'ores* come from the same use of the word, and owe their appellation to the ora. Clarke on Coins, p. 307, &c.

ORA *Cabaça*, in *Geography*, a bay on the N. coast of Jamaica.

ORABY, a town of Sweden, in the province of Schonen; 32 miles S. of Christianstadt.

ORACH, or ORACHE, in *Botany*. See ATRIPLEX.

ORACH, *Orache*, or *Stinking Goose-foot*, in *Botany* and the *Materia Medica*. See CHENOPODIUM *Olidum*.

ORACH, *Berry-Bearing*. See BLITUM.

ORACH, *Creeping Shrubby*. See ATRAPHAXIS.

ORACH, *Wild*. See CHENOPODIUM.

ORACH, in *Geography*, a town of Bosnia, the capital of a Sangiacate; 96 miles S.S.W. of Belgrade.

ORACHAU, a lake of Silesia, in the principality of Glogau; five miles N.N.E. of Kontop.

ORACLE, an answer, usually couched in very dark and ambiguous terms, supposed to be given by dæmons of old, either by the mouths of their idols, or by those of their priests, to the people, who consulted them on things to come.

ORACLE is also used for the dæmon who gave the answer, and the place where it was given. See DÆMON.

Seneca defines oracles to be enunciations by the mouths of men of the will of the gods: and Cicero simply calls them the language of the gods, "*Deorum oratio*." Among the Pagans they were held in high estimation; and they were consulted on a variety of occasions, pertaining to national enterprises and private life. When they made peace or war, enacted laws, reformed states, or changed the constitution, they had in all these cases recourse to the oracle by public authority. Also, in private life, if a man wished to marry, if he proposed to take a journey, or to engage in any business of importance, he repaired to the oracle for counsel. Mankind have had always a propensity to explore futurity; and conceiving that future events were known to their gods, who possessed the gift of prophecy, they sought information and advice from the oracles, which in their opinion were supernatural and divine communications. The institution of oracles seemed to gratify the prevalent curiosity of mankind, and proved a source of immense wealth, as well as authority and influence, to those who had the command of them. Accordingly every nation, in which idolatry has subsisted, had its oracles, by means of which imposture practised on superstition and credulity.

The principal oracles of antiquity are that of Abæ, mentioned by Herodotus; that of Amphiaras at Oropus in Macedonia; that of the Branchidæ at Didymus; that of

the camps at Lacedæmon; that of Dodona; that of Jupiter Ammon; that of Nabarca, in the country of the Anariaci, near the Caspian sea; that of Trophonius, mentioned by Herodotus; that of Chrysepolis; that of Claros, in Ionia; that of Amphilochous at Mallus; that of Patarea; that of Pello in Macedonia; that of Phafelides in Cilicia; that of Sinope in Paphlagonia; that of Orpheus's head at Lesbos, mentioned by Philostratus, in the life of Apollonius, &c.

But of all oracles, the oracle of Apollo Pythius at Delphi was the most celebrated; this was consulted in the *dernier ressort*, by most of the princes of those ages. See DELPHI and PYTHIA.

We have already observed that most of the Pagan deities had their appropriate oracles. Apollo had the greatest number: such as those of Claros, of the Branchidæ, of the suburbs of Daphne at Antioch, of Delos, of Argos, of Troas, Æolis, &c. of Baiz in Italy, and others in Cilicia, in Egypt, in the Alps, in Thrace, at Corinth, in Arcadia, in Laconia, and in many other places enumerated by Van Dale. Jupiter, besides that of Dodona and some others, the honour of which he shared with Apollo, had one in Bœotia, under the name of Jupiter the Thunderer, and another in Elis, one at Thebes and at Meroe, one near Antioch, and several others. Æsculapius was consulted in Cilicia, at Apollonia, in the isle of Cos, at Epidaurus, Pergamus, Rome, and elsewhere: Mercury had oracles at Patras, upon Hæmon, and in other places: Mars in Thrace, Egypt, and elsewhere: Hercules at Cadiz, Athens, in Egypt, at Tivoli, in Mesopotamia, where he issued his oracles by dreams, whence he was called "*Somnialis*:" Isis, Osiris, and Serapis delivered in like manner their oracles by dreams, as we learn from Pausanias, Tacitus, Arrian, and other writers: that of Amphilochous was also delivered by dreams: the ox Apis had also his oracle in Egypt. The gods, called Cabiri, had their oracle in Bœotia: Diana, the sister of Apollo, had several oracles in Egypt, Cilicia, Ephesus, &c. Those of Fortune at Præneste and of the Lots at Antium are well known. The Fountains also delivered oracles, for to each of them a divinity was ascribed: such was the fountain of Castalia at Delphi, another of the same name in the suburbs of Antioch, and the prophetic fountain near the temple of Ceres in Achaia. Juno had several oracles; one near Corinth, one at Nyfa, and others at other places. Latona had one at Butis in Egypt: Leucothea had one in Colchis: Memnon in Egypt; Machaon at Gerania in Laconia; Minerva had one in Egypt, in Spain, upon mount Ætna, at Mycenæ and Colchis, and in other places. Those of Neptune were at Delphos, at Calauria, near Neocesarea, and elsewhere. The Nymphs had theirs in the cave of Corycia. Pan had several, the most famous of which was that in Arcadia. That of the Palici was in Sicily. Pluto had one at Nyfa. Saturn had oracles in several places, but the most famous were those of Cumæ in Italy and of Alexandria in Egypt. Those of Venus were dispersed in several places, at Gaza, upon mount Libanus, at Paphos, in Cyprus, &c. Serapis had one at Alexandria, consulted by Vespasian. Venus Aphacite had one at Aphaca between Heliopolis and Byblus. Geryon, the three-headed monster, slain by Hercules, had an oracle in Italy near Padua, consulted by Tiberius; that of Hercules was at Tivoli, and was given by lots, like those at Præneste and Antium. The demi-gods and heroes had likewise their oracles, such were those of Castor and Pollux at Lacedæmon, of Amphiaras, of Mopso in Cilicia, of Ulysses, Amphilochous, Sarpedon in Troas, Hermione in Macedonia, Paliphae in Laconia, Chalcas in Italy, Aristæus in Bœotia, Autolycus at Sinope, Phryxus among the Colchi, Zamolxis among the Getæ, Ephestion the

the minion of Alexander, and Antinous, &c. &c. for which we refer to Van Dale. The responses of oracles were delivered in a variety of ways: at Delphi, they interpreted and put into verse what the priests pronounced in the time of her fury.

Mr. Bayle observes, that at first it gave its answers in verse; and that it fell at length to prose, upon the people's beginning to laugh at the poorness of its versification. The Epicureans made this the subject of their jests, and said, in raillery, it was surprizing enough, that Apollo, the god of poetry, should be a much worse poet than Homer, whom he himself had inspired. By the railleries of these philosophers, and particularly those of the Cynics and Peripatetics, the priests were at length obliged to desist from the practice of versifying the responses of the Pythia, which, according to Plutarch, was one of the principal causes of the declension of the oracle of Delphos.

At the oracle of Ammon, the priests pronounced the response of their god; at Dodona, the response was issued from the hollow of an oak; at the cave of Trophonius, the oracle was inferred from what the suppliant said before he recovered his senses; at Memphis, they drew a good or bad omen, according as the ox Apis received or rejected what was presented to him, which was also the case with the fishes of the fountain of Limyra. The suppliants, who consulted the oracles, were not allowed to enter the sanctuaries where they were given; and accordingly care was taken, that neither the Epicureans nor Christians should come near them. In several places, the oracles were given by letters sealed up, as in that of Mopsus, and at Mallus in Cilicia. Oracles were frequently given by lot, the mode of doing which was as follows: the lots were a kind of dice, on which were engraven certain characters or words, whose explanations they were to seek on tables made for the purpose. The way of using these dice for knowing futurity, was different, according to the places where they were used. In some temples, the person threw them himself; in others, they were dropped from a box; whence came the proverbial expression, "the lot is fallen." This playing with dice was always preceded by sacrifices and other customary ceremonies. (See SORTES, &c.) The ambiguity of the oracles in their responses, and their double meaning, contributed to their support.

Ablancourt observes, that the study or research of the meaning of oracles was but a fruitless thing; and that they were never understood till after their accomplishment. Historians relate, that Cræsus was tricked by the ambiguity and equivocation of the oracle:

Κροισος Αλκην διαβοας μετ'αλκην αρχην καταλυσει.

Thus rendered in Latin:

"Cræsus Halym superans magnam pervertet opum vim."

Thus, if the Lydian monarch had conquered Cyrus, he overthrew the Assyrian empire; if he himself was routed, he overturned his own. That delivered to Pyrrhus, which is comprised in this Latin verse,

"Credo equidem Æacidas Romanos vincere posse,"

had the same advantage; for, according to the rules of syntax, either of the two accusatives may be governed by the verb, and the verse be explained, either by saying the Romans shall conquer the Æacidae, of whom Pyrrhus was defended, or those shall conquer the Romans. When Alexander fell sick at Babylon, some of his courtiers, who happened to be in Egypt, or who went thither on purpose, passed the night in the temple of Serapis, to enquire if it

would not be proper to bring Alexander to be cured by him. The god answered, it was better that Alexander should remain where he was. This in all events was a very prudent and safe answer. If the king recovered his health, what glory must Serapis have gained by saving him the fatigue of the journey! If he died, it was but saying he died in a favourable juncture after so many conquests; which, had he lived, he could neither have enlarged nor preserved. That is actually the construction they put upon the response; whereas had Alexander undertaken the journey, and died in the temple, or by the way, nothing could have been said in favour of Serapis.

When Trajan had formed the design of his expedition against the Parthians, he was advised to consult the oracle of Heliopolis, to which he had no more to do but send a note under a seal. That prince, who had no great faith in oracles, sent thither a blank note; and they returned him another of the same. By this Trajan was convinced of the divinity of the oracle. He sends back a second note to the god, wherein he enquired, whether he should return to Rome after finishing the war he had in view. The god, as Macrobius tells the story, ordered a vine, which was among the offerings of his temple, to be divided into pieces, and brought to Trajan. The event justified the oracle; for the emperor dying in that war, his bones were carried to Rome, which had been represented by that broken vine. As the priests of that oracle knew Trajan's design, which was no secret, they happily devised that response, which, in all events, was capable of a favourable interpretation, whether he routed and cut the Parthians in pieces, or if his army met with the same fate.

Sometimes the responses of the oracles were mere banter, as in the case of the man who wished to know by what means he might become rich, and who received for answer from the god, that he had only to make himself master of all that lay between Sicyon and Corinth. Another wanting a cure for the gout, was answered by the oracle, that he was to drink nothing but cold water.

There are two points in dispute on the subject of oracles; viz. whether they were human, or diabolical machines; and whether or not they ceased upon the publication or preaching of the gospel.

Most of the fathers of the church supposed that the devil issued oracles; and looked on it as a pleasure he took to give dubious and equivocal answers, in order to have a handle to laugh at them. Vossius allows that it was the devil who spoke in oracles; but thinks that the obscurity of his answers was owing to his ignorance as to the precise circumstances of events. That artful and studied obscurity, in which the answers were couched, says he, shewed the embarrass the devil was under; as those double meanings they usually bore provided for their accomplishment. Where the thing foretold did not happen accordingly, the oracle, forsooth, was misunderstood.

Eusebius has preserved some fragments of a philosopher, called Oenomaus; who, out of resentment for his having been so often fooled by the oracles, wrote an ample confutation of all their impertinencies: "When we come to consult thee," says he to Apollo, "if thou feelt what is in futurity, why dost thou use expressions that will not be understood? Dost thou not know, that they will not be understood? If thou dost, thou takest pleasure in abusing us; if thou dost not, be informed of us, and learn to speak more clearly. I tell thee, that if thou intendest an equivocal, the Greek word whereby thou affirmedst, that Cræsus should overthrow a great empire, was ill chosen; and that it could signify nothing but Cræsus's conquering

Cyrus. If things must necessarily come to pass, why dost thou amuse us with thy ambiguities? What dost thou, wretch as thou art, at Delphi; employed in muttering idle prophecies!"

But Oenomaus is still more out of humour with the oracle, for the answer which Apollo gave the Athenians, when Xerxes was about to attack Greece with all the strength of Asia. The Pythian declared, that Minerva, the protectress of Athens, had endeavoured in vain to appease the wrath of Jupiter; yet that Jupiter, in complaisance to his daughter, was willing the Athenians should save themselves within wooden walls; and that Salamis should behold the loss of a great many children, dear to their mothers, either when Ceres was spread abroad, or gathered together.

Here Oenomaus loses all patience with the god of Delphi. "This contest," says he, "between father and daughter is very becoming the deities! It is excellent, that there should be contrary inclinations and interests in heaven. Poor wizard, thou art ignorant whose the children are, that Salamis shall see perish; whether Greeks or Persians. It is certain they must be either one, or the other; but thou needest not to have told so openly, that thou knewest not which. Thou concealest the time of the battle under those fine poetical expressions, *either when Ceres is spread abroad, or gathered together*; and wouldst thou cajole us with such pompous language? Who knows not, that if there be a sea-fight, it must either be in seed-time or harvest? It is certain it cannot be in winter. Let things go how they will, thou wilt secure thyself by this Jupiter, whom Minerva is endeavouring to appease. If the Greeks lose the battle, Jupiter proved inexorable to the last; if they gain it, why then Minerva at length prevailed."

It is a very general opinion among the more learned, that oracles were all mere cheats and impostures; either calculated to serve the avaricious ends of the heathen priests, or the political views of the princes.

M. Bayle says positively, they were mere human artifices, in which the devil had no hand. He was strongly supported by Van Dale, and M. Fontenelle, who have written expressly on the subject.

Father Balthus, a Jesuit, wrote a treatise in defence of the fathers with regard to the origin of oracles; but without denying the imposture of the priests, often blended with the oracles. He maintains the intervention of the devil in some predictions, which could not be ascribed to the cheats of Jesuits alone. The abbé Banier espouses the same side of the question, and objects that oracles would not have lasted so long, and supported themselves with so much splendour and reputation, if they had been merely owing to the forgery of the priests.

Bishop Sherlock, in his "Discourses concerning the Use and Intent of Prophecy," expresses his opinion, that it is impious to disbelieve the Heathen oracles, and to deny them to have been given out by the devil; to which assertion Dr. Middleton, in his "Examination, &c." (Works, vol. iii. p. 186.) replies, that he is guilty of this impiety, and that he thinks himself warranted to pronounce from the authority of the best and wisest of the Heathens themselves, and the evidence of plain facts, which are recorded of those oracles, as well as from the nature of the thing itself, that they were all mere imposture, wholly invented and supported by human craft; without any supernatural aid or interposition whatsoever. He alleges, that Cicero, speaking of the Delphic oracle, the most revered of any in the Heathen world, declares, "that nothing was become more contemptible, not only in his days, but long before him;" that Demosthenes, who lived about 300 years earlier, affirmed of the same ora-

cle, in a public speech to the people of Athens, that it "was gained to the interests of king Philip," an enemy to that city; that the Greek historians tell us, how, on several other occasions, it had been corrupted by money, to serve the views of particular persons and parties, and the prophets sometimes deposed for bribery, and for lewdness; that there were some great sects of philosophers, who, by principle, disavowed the authority of all oracles; agreeably to all which Strabo tells us, that divination in general and oracles had been in high credit among the ancients, but in his days were treated with much contempt; lastly, that Eusebius also, the great historian of the primitive church, declares, that there were "600 writers among the Heathens themselves," who had publicly written against the reality of them. Although the primitive fathers constantly affirmed them to have been the real effects of a supernatural power, and given out by the devil; yet M. de Fontenelle maintains, that, while those fathers preferred that way of combating the authority of the oracles, as the most commodious to themselves, and to the state of the controversy, between them and the Heathens, yet they believed them at the same time to be nothing else but the effects of human fraud and contrivance; which he has illustrated by the examples of Clemens of Alexandria, Origen, and Eusebius.

Plutarch has a treatise on the ceasing of some oracles; and Van Dale, a Dutch physician, has a volume to prove they did not cease at the coming of Christ; but that many of them ceased long before; and that others held till the fall of Paganism, under the empire of Theodosius the Great; when Paganism being dissipated, these institutions could no longer subsist.

Van Dale was answered by a German, one Mæbius, professor of theology at Leipzig, in 1685. M. Fontenelle espoused Van Dale's system, and improved upon it in his History of Oracles; and shewed the weakness of the argument used by many writers in behalf of Christianity, drawn from the ceasing of oracles.

It was Eusebius who first endeavoured to persuade the Christians, that the coming of Jesus Christ had struck the oracles dumb; though it appears from the laws of Theodosius, Gratian, and Valentinian, that the oracles were still consulted as low as the year 358. Cicero says, the oracles became dumb, in proportion as people, growing less credulous, began to suspect them for cheats.

Plutarch alleges two reasons for the ceasing of oracles: the one was Apollo's chagrin; who, it seems, took it in dudgeon to be interrogated about so many trifles. The other was, that in proportion as the genii, or dæmons, who had the management of the oracles, died, and became extinct, the oracles must necessarily cease. He adds a third and more natural cause for the ceasing of oracles; viz. the forlorn state of Greece, ruined and desolated by wars. For, hence, the smallness of the gains let the priests sink into a poverty and contempt too bare to cover the fraud.

That the oracles were silenced about or soon after the time of our Saviour's advent, may be proved, says Dr. Leland, in the first volume of his learned work on "The Necessity and Advantage of Revelation, &c." from express testimonies, not only of Christian, but of Heathen authors. Lucan, who wrote his "Pharsalia" in the reign of Nero, scarcely 30 years after our Lord's crucifixion, laments it as one of the greatest misfortunes of that age, that the Delphian oracle, which he represents as one of the choicest gifts of the gods, was become silent.

"Non ullo sæcula dono

Nostra carent majore Deum, quam Delphica Sedes
Quod fileat." Pharsal. l. v. v. 111.

In like manner Juvenal says,

"———Delphis oracula cessant,
Et genus humanum damnat caligo futuri."

Sat. vi. v. 544.

Lucian says, that when he was at Delphi, the oracle gave no answer, nor was the priestess inspired. See his *Phalaris*. Oper. tom. i. This likewise appears from Plutarch's treatise, why the oracles cease to give answers, already cited; whence it is also manifest, that the most learned Heathens were very much at a loss how to give a tolerable account of it. Porphyry, in a passage used from him by Eusebius (*Præp. Evang. lib. v. c. 1.*) says, "the city of Rome was overrun with sickness. Æsculapius and the rest of the gods having withdrawn their converse with men; because since Jesus began to be worshipped, no man had received any public help or benefit from the gods."

ORACLES of the *Sibyls*. See *SIBYL*.

ORAHOVITZKA, in *Geography*, a town of Sclavonia; 16 miles W. of Valpo.

ORAISON, a town of France, in the department of the Lower Alps, on the Durance; 18 miles S.W. of Digne.

ORAL, something delivered by the mouth, or voice. In this sense, we say, *oral law*, *oral tradition*, &c.

ORAMANE, in *Geography*, a river of Canada, which runs into the gulf of St. Lawrence, N. lat. $50^{\circ} 7'$. W. long. 61° .

ORAMTCHI-HOTUN, a town of Thibet; 58 miles W.N.W. of Tourfan. N. lat. $44^{\circ} 2'$. E. long. $88^{\circ} 17'$.

ORAN, or WEIRAN, a town of Algiers, and one of the largest in the province of Mascara, sometimes called Tremecen or Tlemfan, situated on the declivity and near the foot of a high mountain, which overlooks it from the N. and N.W. Towards the sea the city rises in the form of an amphitheatre, and is surrounded with forts and batteries. Close to it lies a strong castle, called "Alcazava," in which the Spanish governor resides. It has strong and regular fortifications, and can easily be supplied by the Spaniards with provisions and warlike stores. On the highest hill stands Fort St. Croix, whose guns command the city and the adjacent country. From this fort they make signals of the approach of ships, and carefully watch the motions of the Moors, who often attempt predatory excursions into the neighbouring districts. A deep winding valley serves as a trench on the S. side, where, likewise, at a little distance, is a very plentiful spring of excellent water. The rivulet formed by this fountain conforms in its course to the several windings of the valley, and passing afterwards under the walls of the city, liberally supplies it with water. In 1509 this city was taken by the Spaniards, under the command of cardinal Ximenes, then prime minister, and continued in their possession till the disturbances occasioned in Spain by the succeeding war in 1708, when the Algerines retook it. But notwithstanding all their expence and labour for its preservation, it was recovered by the Spaniards in 1732, and ever since they have maintained the uninterrupted possession of it, and have adorned it with several beautiful churches and other edifices. Dr. Shaw found no Roman antiquities in Oran. The Spaniards, however, in their architecture have imitated the Roman style, and they have carved upon the friezes, and in other convenient places, several inscriptions in large characters, and in their own language. In the year 1790 this place was almost destroyed by an earthquake; the number of persons who perished was estimated at more than 2000, including 22 officers, and 304 private soldiers belonging to the garrison. It has a parish church, three monasteries, and a hospital; and the number of in-

habitants, according to the account given of it by the Spaniards, amounts to 12,000. A considerable number of Mahometans take refuge in Oran; they occupy a distinct part of the city, receive pay from the court of Spain, and render signal services against the Moors. The greatest part of the inhabitants of Oran consists of such as have been banished from Spain; and the same may be also said, in a great measure, of the soldiers who compose the garrison. Five regiments are commonly stationed here; but on account of continual desertion, their strength scarcely equals that of four complete regiments. One of them wholly consists of malefactors, who have been condemned to remain here for life. The rest are such as have been transported for one or more years. Here is likewise a military school. Around the city are pleasant gardens; but it is very dangerous to cultivate them, on account of the Moors and Arabs, who frequently lie in ambush among them. The same objection lies against the cultivation of the fields in the vicinity; so that the garrison and the inhabitants must be supplied with provisions immediately from Spain. N. lat. $35^{\circ} 35'$. W. long. $0^{\circ} 35'$.

ORANAI. See *RANAI*.

ORANDO *pro Rege & Regno*, an ancient writ. Before the Reformation, while there was no standing collect for a fitting parliament, when the houses of parliament were met, they petitioned the king that he would require the bishops and clergy to pray for the peace and good government of the realm, and for a continuance of the good understanding between his majesty and the estates of the kingdom; and accordingly the writ *de orando pro rege & regno* was issued, which was common in the time of king Edward III.

ORANG'S KEY, in *Geography*, one of the Bahama islands. N. lat. $24^{\circ} 29'$. W. long. $79^{\circ} 35'$.

ORANGABAD, a town of Hindoostan, in the subah of Agra; 15 miles N. of Fattipour.

ORANGE-TREE, *Aurantium*, in *Botany*, *Gardening*, and the *Materia Medica*. See *CITRUS*.

Oranges are ordinarily preserved in halves and quarters. They are first peeled, then scooped, and dried in a stove. Orangeal is the orange-peel cut in pieces, and candied. Italy furnishes a great deal of flower of oranges, either dry or liquid.

ORANGE, *Sea*, in *Natural History*, a name given by count Marigli to a very remarkable species of marine substance, which he calls a plant. This is the *ALCYONIUM Lyncurium* of the Linnæan system; which see. It is tough and firm in its structure, and in many things resembles the common fucus; but instead of growing into the branched form the generality of those substances have, it is round and hollow, and in all respects resembles the shape of an orange. It has, by way of root, certain very fine filaments, which fasten themselves to the rocks, or to shells, stone, or any thing else that comes in the way. From these there grows no pedicle, but the body of the orange, as it is called, is fastened by them to the rock, or other solid substances. The orange itself is usually of about three or four inches in diameter; and while in the sea, is full of water, and retains this when taken up. In this state it frequently weighs a pound and a half, but when the water is let out, and it is dried, it becomes a mere membrane, weighing scarcely any thing. It is best preserved, by stuffing it full of cotton, as soon as the water is let out of it, and hanging it up to dry in this form. Its surface is irregular and rough, and its colour a dusky green on the outside, and a clearer, but somewhat blueish-green within; and its thickness about an eighth part of an inch. When viewed by the microscope, it is seen to be all over covered with small glandules, or, indeed, composed of them;

them; for they stand so thick, one by another, as to leave no space between, and seem to make up the whole substance; so that it appears very like the rough shagreen skin used to cover toys. These are all so many hollow ducts, through which the sea-water finds a passage into the globe formed by this skin, and by this means it is kept always full and distended; on cutting it with a pair of scissars, the water immediately runs out, and the skins collapse; but there is something farther remarkable, which is, that the whole substance, near the wounded place, is in motion, and seems as if alive, and sensible of the wound. The glandules are found full of water, and resembling small transparent bottles; and what goes to the structure of the substance beside these, is an assemblage of a vast number of filaments, all which are also hollow, and filled with a clear and transparent fluid.

There is another substance of this kind, described by count Marfigli, Triumfetti, and others, and called the *ramose*, or branched orange. This is very much of the nature of the former; but, instead of consisting of one round globule, it is formed of several oblong ones, all joined so together, that they represent the branches of some of the fucuses, but that they are shorter; and these are all hollow and full of water, in the same manner as the single globes of the common kind. This has, by way of root, certain fine and slender filaments, which fasten it to the stones or shells near which it is produced; and it is of a dusky greenish colour on the surface, and of a fine blueish-green within. The surface, viewed by the microscope, appears rough, as in the other, and the glandules are of the same kind, and are always found full of clear water. Marfigli, Hist. de la Mer, p. 81. See CORALLINES.

ORANGE-Colour, is a hue or die that partakes equally of red and yellow; or is a medium between the two.

In heraldry, the term *orange* or *orange* is given in blazon to all roundles that are tenné or tawny.

ORANGE-Dew, a sort of dew which falls in the spring-time from the leaves of orange and lemon-trees, and is extremely fine and subtile. M. De La Hire observing this, placed some flat pieces of glass under the leaves to receive it, and having thus procured some large drops of it, was desirous of finding out what it was. He soon found that it was not a merely aqueous fluid, because it did not evaporate in the air; and that it was not a resin, because it readily and perfectly mixed with water: it was natural here to suppose it a liquid gum; but neither did this, on examination, prove to be the case; for being laid on paper, it did not dry as the other liquid gums do. Its answering to none of these characters, and its being of the consistence of honey, and of a sweet sugar-like taste, gave a suspicion of its being a kind of manna; and whatever in the other trials had proved it not a resin, a gum, &c. all equally tends to prove that it is this substance.

ORANGE-flower-Water. See WATER.

ORANGE-Lake. See LAKE.

ORANGE, Mock. See PHILADELPHUS.

ORANGE, in Geography, a bay on the N.E. coast of Jamaica; and also a bay at the N.W. end of the same island, in which is a small island, called "Orange-key, or Cay."—Also, a bay on the E. coast of Newfoundland. N. lat. 50° 32'. W. long. 56° 10'.—Also, a cape, the E. point of Oyapok river, S.E. of Cayenne island. N. lat. 4° 20'. W. long. 50° 50'.

ORANGE, a county of Vermont in America, containing 20 townships and 18,238 inhabitants. The county-town is Newbury, and the townships S. of it are Bradford, Fairlee, and Thetford. The land is high and furnishes numerous

streams in opposite directions, both to Connecticut river and to lake Champlain.—Also, a township on the N. line of the above county, in the N.E. corner of which is Knox's mountain, containing 338 inhabitants.—Also, a township, formerly "Cardigan," in Grafton county, New Hampshire, which gives rise to an E. branch of Mascomy river; incorporated in 1789 and containing 203 inhabitants; 20 miles E. of Dartmouth college.—Also, a township of Massachusetts, on the E. line of Hampshire county, on Miller's river, 75 miles N.W. by W. of Boston; incorporated in 1783, and containing 766 inhabitants.—Also, a mountainous and hilly county of New York, divided into 9 townships, the chief of which is Goshen; containing 29,355 inhabitants, of whom 1145 are slaves. The excellent butter of this county is collected at Newburgh and New Windsor, and thence transported to New York. On the N. side of the mountains in this county is a very valuable tract called the "Drowned Lands," and containing about 40 or 50,000 acres.—Also, a town called "Orangedale," in Essex county, New Jersey, containing about 80 houses, a Presbyterian church, and a flourishing academy, and lying N.W. of Newark, which adjoins to it.—Also, a county of Hillsborough district, North Carolina; containing 15,657 inhabitants, of whom 3327 are slaves. The chief town is Hillsborough.—Also, a county of South Carolina, in Orangeburg district.—Also, a county of Virginia, containing 6207 free inhabitants, and 5242 slaves: this county is 55 miles long and 10 broad, and comprehends 320,000 acres. It has been so long under culture with tobacco and Indian corn, that the soil is greatly impoverished. It has three episcopal churches, five or six Baptist churches, and one belonging to the Presbyterians; 127 miles from Washington.—Also, a town of France, and principal place of a district, in the department of Vaucluse; before the revolution the capital of a principality and the see of a bishop. The town contains 7270, and its two cantons 18,493 inhabitants, on a territory of 287½ kilometres, in 10 communes. Among other remains of Roman antiquities in this place are a fine triumphal arch, and an amphitheatre. The principality extends about 10 miles in length and 7 in breadth; and the annual revenue was about 50,000 livres. In the 11th century it had courts of its own, and soon acquired the title of a principality. The sovereignty was in the year 1598 conferred to the house of Nassau by the treaty of Vervins. In 1678 by that of Nimègue, and in 1697 by that of Ryswick. William Henry, prince of Orange, was stadtholder of Holland in 1672, and in 1689 king of England. After his death, the most powerful of the kings who laid claim to it was the king of Prussia; but in 1712, king Frederick William, by the treaty of Utrecht, ceded it to the house of Bourbon. At the close of the year 1714, it was annexed to the government of Dauphiny, the generality and intendency of Grenoble and Montelimart. In 1722, Louis XV. gave it to the prince of Conti. It contained one city, two small towns, and about nine villages, and was exempted from all the usual taxes in France. N. lat. 44° 8'. E. long. 4° 53'.

ORANGE River, a river of Jamaica, which runs into the sea, 4 miles E. of Montego bay.—Also, a river of Africa, which rises in a mountain in the eastern part of the settlement of the Cape of Good Hope, about 150 miles from the Indian sea, and after a westerly course of about 600 miles runs into the Atlantic, S. lat 28° 30'.

ORANGE-Town, or *Greenland*, a plantation in Cumberland county, and state of Maine in America, N.W. of Waterford. This is a mountainous country; some of its mountains having precipices 200 feet perpendicular. The sides

of the mountains and the vallies are fertile, producing good crops, and, in some instances, affording wild onions, which resemble those that are cultivated. Winter rye, which is the chief produce, has amounted to twenty bushels on an acre. The neighbouring country formerly abounded with variety of game, such as moose deer, bears, beavers, racoons, fables, &c. but since it has been inhabited game is become scarce.

ORANGE-Town, or *Tappan*, a township in Orange county, New York, situated on the W. side of the Tappan sea, opposite to Philipsburg, and about 27 miles N. of New York city. This township is bounded E. by Hudson river, and S. by the state of New Jersey. It contained, in 1790, 1175 free inhabitants, and 203 slaves.

ORANGE-Town, a town of Washington county, in the state of Maine; 19 miles from Machias.

ORANGEADE, a drink made of orange-juice, water, and sugar.

Lemery says it may be given to people in the height of a fever.

ORANGEBURG, in *Geography*, a district of South Carolina, bounded S.W. by Edisto river: it is divided into three counties, *viz.* Lewisburg, Orange, and Lexington. In its interior are extensive forests of pine. It is watered by the N. and S. branches of Edisto river, and contains 13,766 inhabitants, of whom 5356 are slaves.—Also, a post-town of South Carolina, and capital of the above district, on the E. side of the N. branch of Edisto river: containing a court-house, gaol, and about 20 houses; 77 miles N.N.W. of Charleston.

ORANGERY, a gallery in a garden, or parterre, exposed to the south, but well closed with a glass window, to preserve oranges in during the winter season.

The orangery of Versailles is the most magnificent that ever was built: it has wings, and is decorated with a Tuscan order.

ORANGERY is also used for the parterre, where the oranges are exposed in kindly weather.

ORANG-OUTANG, in *Zoology*, the *Homo sylvestris* of Edwards, *Simia satyrus* of Linnæus. (See *SIMIA*. See also *MAN*.) These animals will attack and kill the negroes who wander in the woods; drive away the elephants, beating them with their fists or with clubs; and throw stones at people who offend them; they sleep in trees, and shelter themselves from the inclemency of the weather; their appearance is grave, and their disposition melancholy; they are very swift, walk erect, and can only be taken alive, and tamed when they are young; in which case they are very docile. M. Buffon relates, that he had seen this animal offer his hand to those who came to see him, and walk with them, as if he had been one of the company; that he has seen him sit at table, unfold his napkin, wipe his lips, make use of his knife and fork, pour out his drink into a glass, take his cup and saucer, put in sugar, pour out the tea, and stir it, in order to let it cool; and that he has done this not only at the command of his master, but often without bidding. He did no kind of mischief, and offered himself to be caressed by strangers. The food which he preferred to every other was dried ripe fruit. A traveller relates, that he has seen a female of this species at Java, who every morning regularly made its own bed; at night lay down with the head on the bolster, and covered itself with the quilt. When its head ached, it wrapped a handkerchief round it. Hoppius, in his *Anthropomorpha*, 1760, takes great pains to prove, that the orang-outang is incapable, from the extreme dilatation of the pupil, of seeing in the day time. Dr. Camper, late professor of astronomy,

&c. in the university of Groningen, having dissected the whole organ of voice in the orang, in apes, and several monkeys, concludes, that oranges and apes are not made to modulate the voice like men; for the air passing by the *rima glottidis* is immediately lost in the ventricles or ventricle of the neck, as in apes and monkeys, and must, consequently, return from thence without any force and melody within the throat and mouth of these creatures; and this seems to be the most evident proof of the incapacity of oranges, apes, and monkeys, to utter any modulated voice, as indeed they have never been observed to do. Phil. Transf. vol. lxi. part i. art. 14. where the reader may find an account of the dissection of the organs of speech of the orang-outang, illustrated by figures. See *Anatomy of MAMMALIA*.

This animal, some have supposed, is the prototype of all the fauns, satyrs, pans, and sileni, described by the ancient poets, and whose forms are come down to us in the works of the painters, and sculptors of antiquity; varied and embellished according to the fancy of the authors. They seem to have been more numerous formerly than at present, if we credit the account of the large troop, to whom Alexander, when in India, prepared to give battle; and the attack made by Hanno on another large body, in an island on the coast of Africa, where he took three of the females, whose skins were deposited in the temple of Juno, and found there by the Romans at the taking of Carthage. Vide Strab. lib. xv. and Hannonis Periplum, p. 77. ed. Hagæ, 1674.

Mr. Pennant apprehends, that the satyrs of the ancients were a species of monkey, and not the same with this animal; because Ælian and Ptolemy affirm, that they had tails. See *SIMIA* and *CHIMPANZEE*.

ORANIENBAUM, in *Geography*, a town of Germany, in the duchy of Anhalt-Deßau; 6 miles S.E. of Deßau. N. lat. 51° 48'. E. long. 12° 28'.—Also, a town of Russia, in the gulf of Finland, where is a royal palace, built by prince Menzikoff, afterwards converted into an hospital; but much used as a residence by the emperor Peter III.; 20 miles W. of Petersburg. N. lat. 59° 52'. E. long. 29° 26'.

ORANIENBURG, a town of Brandenburg, in the Middle Mark, anciently called "Boetzow," situated on the Havel, and containing two churches. In 1699, a colony of the Vaudois, driven by persecution on account of religion from their own country, was established here. In 1671 the place was destroyed by fire; 18 miles N. of Berlin. N. lat. 52° 45'. E. long. 13° 19'.

ORANMORE, a post-town of Ireland, in the county of Galway; 98 miles W. by S. from Dublin, and 5 miles E. from Galway.

ORANSAY. See *COLONSAY*, and *ORONSAY*.

ORARIUM, in *Ecclesiastical Writers*, the same with *brandeum*.

ORARNE, in *Geography, a small island on the W. side of the gulf of Bothnia. N. lat. 60° 42'. E. long. 17° 7'.*

ORATAVA, a sea-port town on the W. side of the island of Teneriffe, and the chief place of trade; the harbour of which is rendered unsafe by a N.W. wind: it contains one church and several convents; 5 miles N. of Laguna.

ORATION, a speech or harangue, framed according to the rules of oratory, and spoken in public.

All the kinds of orations may be reduced to three heads; *viz.* demonstrative, deliberative, and judicial. Aristotle is said to be the author of this division, which seems to be very just; since, perhaps, there is no subject of oratory, whether sacred or civil, that may not be referred to one or other of these heads. It is a division which runs through all the ancient

cient treatises on rhetoric, and is followed by the moderns who copy them. Dr. Blair, however, though upon the whole he approves and commends this division, somewhat deviates from it; and prefers following that division which the train of modern speaking naturally points out to us, taken from the three great scenes of eloquence, popular assemblies, the bar, and the pulpit, each of which has a distinct character that particularly suits it. This division coincides in part with the ancient one. The eloquence of the bar is precisely the same with what the ancients called the judicial. The eloquence of popular assemblies, (for which see PUBLIC SPEAKING,) consists mostly of what the ancients term the deliberative species, and yet admits also of the demonstrative. The eloquence of the pulpit (for which see PULPIT and ELOCUTION) is altogether of a distinct nature, and cannot be properly comprehended under any of the heads of the ancient rhetoricians. Adhering, however, to the ancient distribution, we observe that to the demonstrative kind belong all such discourses as relate to the praise or dispraise of persons or things, as *panegyrics, invectives, genethliaca, epithalamia, epicedia, eucharistia, epinicia, congratulations, and funeral orations*. See DEMONSTRATIVE.

To the deliberative kind belong whatever may become a subject of debate, consultation, or advice, by means of *persuasion, dissuasion, exhortation, and commendation*. See DELIBERATIVE.

To the judicial kind belong all subjects which pertain to the security of property, the protection of innocence, the maintenance of justice, and punishment of crimes, by *accusation, confirmation, confutation, &c.* See each under its proper article, CONFIRMATION, &c.

The judicial is the same with the eloquence of the bar employed in addressing judges, who have power to absolve or condemn. In judicial affairs, both the Grecian and Roman youth who were desirous to gain a reputation for eloquence, used commonly to give the first proofs of their genius and ability. The first of Cicero's orations now extant is his defence of Publius Quintus, which he spoke in the 26th year of his age. It was, indeed, at the bar that young orators used first to exercise and try their genius in public; and they took care to prepare themselves for this, by declaiming beforehand, either in the schools, or under the instruction of some skilful person in private. In judicial controversies there are two parties, the plaintiff or prosecutor, and the defendant or person charged. The subject is something past; and the end proposed by them Cicero calls "equity," or "right and equity;" the former of which arises from the laws of the country, and the latter from reason and the nature of things. As causes may arise from a great variety of things, writers have reduced them to three heads, which they call "States," to one of which all judicial proceedings may be referred. See an account of these states, under the article CONTROVERSY.

All judicial causes are either *private* or *public*: that is, they relate to the right of particular persons, and these are also called *civil* causes, as they are conversant about matters of property; or they are those which relate to public justice and the government of the state, and these are also called *criminal*, because by them crimes are prosecuted, whether they be capital or of a less heinous nature. The "conjectural" state (see CONTROVERSY) comes first in the order of inquiry; and when a person accused denies the fact, three things offer themselves to the consideration of the prosecutor: *viz.* Whether he *would* have done it, whether he *could*, and whether he *did* it. Hence arise three topics; from the *will*, the *power*, and the *signs*, or circumstances which attended the action. The affections of the

mind discover the *will*, such as passion, an old grudge, a desire of revenge, a resentment of an injury, and the like. Under the second head, or the *power* of doing a thing, are comprehended three things, *viz.* the place, the time, and the opportunity. The third head relates to the *signs* and circumstances, which either preceded, accompanied, or followed the commission of the fact. All these arguments, taken from conjectures, are called "presumptions," which, though they do not directly prove that the accused person committed the fact with which he is charged; yet, when being laid together they appeared very strong, sentence might sometimes be given by the Roman law upon them to convict him. These are the topics from which the prosecutor deduces his arguments; and it is the business of the defendant to invalidate them. Sometimes the defendant not only denies that he did the fact, but charges it upon another. Thus Cicero in his oration for Roscius, not only defends him from each of these three heads, but likewise charges the fact upon his accusers. With regard to the *definitive* state (see CONTROVERSY), the heads of argument are much the same to both parties. For each of them defines the fact in his own way, and endeavours to refute the other's definition. The third state is that of *quality* (see CONTROVERSY), in which the dispute turns upon the justice of an action. And here the defendant does not deny he did the thing with which he is charged, but asserts it to be right and equitable, from the circumstances of the cases, and the motives which induced him to do it. Sometimes a fact is rather excused than defended; by pleading that it was not done designedly, or with any ill intent: and this is called *concession*, and includes *apology* and *intreaty*. The former represents the matter as the effect of inadvertency, chance, or necessity: and the latter is a submissive address to the equity and clemency of the court, or party offended, for pardon; as Cicero has done in his oration to Cæsar, in favour of Ligurius.

In the eloquence of the bar, or that which is employed in judicial cases, the great object is conviction. Here it is not the speaker's business to persuade the judges to what is good or useful, but to shew them what is just and true; and of course it is chiefly, or solely to the understanding, that his eloquence is addressed. Besides, speakers at the bar address themselves to one, or to a few judges, who are persons generally of age, gravity, and authority of character. And, moreover, the nature and management of the subjects which belong to the bar require a very different species of oratory from that of popular assemblies, for an account of which see PUBLIC SPEAKING. From the considerations here suggested it appears, that the eloquence of the bar is of a much more limited, more sober, and chastened kind, than that of popular assemblies; and for similar reasons, the judicial orations of Cicero or Demosthenes are not to be regarded as exact models of the manner of speaking which is adapted to the present state of the bar. The nature of the bar anciently, both in Greece and Rome, attained a much nearer approach to popular eloquence than what it now does. Strict law was much less an object of attention in ancient judicial orations than it is become among us. Eloquence, much more than jurisprudence, was the study of those who were to plead causes: and, accordingly, Cicero says, that three months study was sufficient to make any man a complete civilian; nay it was thought, that a person might be a good pleader at the bar, who had never studied law at all. Besides, the civil and criminal judges, both in Greece and Rome, were commonly much more numerous than they are with us, and formed a sort of popular assembly.

fembly. Thus the renowned tribunal of Areopagus at Athens consisted of at least fifty judges. In Rome, the Prætor, who was the proper judge both in civil and criminal causes, named for every cause of moment, the "Judices selecti," as they were called, who were always numerous, and had the office and power of both judge and jury.

It should be duly considered, that among us the foundation of a lawyer's reputation and success must always be laid in a profound knowledge of his own profession. Having laid this foundation by being well acquainted not only with the law in general, but by a knowledge of the cause which he is to plead in particular, he should be apprised, that eloquence in pleading is of the highest moment for giving support to a cause. There is perhaps no scene of public speaking where eloquence is more necessary; and the effect of good speaking is always very great. Consequently, of all the liberal professions, there is not any one that gives fairer play to genius and abilities than that of the advocate. For his encouragement to application and exertion he may consider, that he is sure of coming forward according to his merit; for though interest and friends may set forward a young pleader with advantage at the beginning, they can merely open the field to him. A reputation resting merely on these assistances will soon fall. Spectators observe, Judges decide, Parties watch; and to him will the multitude of clients never fail to resort, who gives the most approved specimens of his knowledge, eloquence, and industry. It is therefore of peculiar importance, that the eloquence adapted to the bar should be properly understood. It is a first principle in this kind of eloquence, that both in speaking or in writing law papers, it should be of the calm and temperate kind, and connected with close reasoning. To those who are beginning to practise at the bar, it should be recommended, that they be careful to avoid verbosity, and that they form themselves to the habit of a strong and a correct style; which expresses the same thing better in a few words, than by the accumulation of intricate and endless periods. Distinctness is also a capital property in speaking at the bar, and this should be manifested, both in stating the question, and in the order and arrangement of all the parts of the pleading. The narration of facts at the bar should always be as concise as the nature of them will admit. When the pleader comes to refute the arguments employed by his adversary, he should be upon his guard not to do them injustice, by disguising them, or placing them in a false light. The deceit is soon discovered, and will not fail of being exposed. Whereas accuracy and candour in stating the arguments that have been used against him, before he proceeds to combat them, will create a strong prepossession in his favour. Wit may sometimes be of service at the bar, especially in a lively reply, but a young pleader, who is too apt to be dazzled by it, should take heed, that he does not rest his strength upon this talent. A proper degree of ardour and vehemence is always of use: it will have a good effect upon the cause, and induce the confidence of clients, for few of them will be fond of trusting their interests in the hands of a cold and unanimated speaker. Nevertheless, his earnestness and sensibility must not betray him into indecorum, and sink him below that dignity of character, which it is of importance for every one in this profession to support. Above all, it should never be forgotten, that there is no instrument of persuasion more powerful than an opinion of probity and honour in the person who undertakes to persuade. This opinion of probity and honour must therefore be carefully preserved, both by some degree of delicacy in the choice of causes, and

by the manner of conducting them. Dr. Blair has given an analysis of Cicero's oration "Pro Cluentio," which he recommends as an excellent example of managing at the bar a complex and intricate cause, with order, elegance, and force. Ward's Orat. vol. i. Blair's Lect. vol. ii. See *ELOCUTION of the Bar*.

A regular formal oration, or discourse, for both these terms are synonymous, consists of the following parts, *viz.* the exordium or introduction, the state and the division of the subject, or the proposition, and enunciation of the subject, narration or explication, the reasoning or arguments, the pathetic part, and the conclusion or peroration. See each under its proper head.

ORATION, *Funeral*. See FUNERAL and DEMONSTRATIVE.

ORATOR, a public speaker, or a person who understands and practises the art of *oratory*; which see.

The disposition and character and qualifications of the speaker comprehend that part of oratory, or rather of invention, which Quintilian calls a "propriety of manners." They more especially respect the proper means, by which he may conciliate the minds of his hearers, engage their affection, and recommend both himself and what he says to their good opinion and esteem. There are four qualities, says Dr. Ward, more especially suited to the character of an orator, which should always appear in his discourses, in order to render what he says acceptable to his hearers; and these are *wisdom, integrity, benevolence, and modesty*. An orator should likewise well consider the circumstances of time and place, with the sentiments and dispositions of those to whom he speaks; which, according to Aristotle, may be distinguished four ways, as they discover themselves by the several *affections, habits, ages, and fortunes* of mankind. It is the orator's business to consider these several characters and circumstances of life, with the different bias and mode of thinking, which they give to the mind, that he may so conduct himself in his behaviour and manner of speaking, as will render him most acceptable, and gain him the good esteem of those to whom he addresses his discourse.

A true orator, says Dr. Blair, should be a person of generous sentiments, of warm feelings, and of a mind turned towards the admiration of all those great and high objects, which mankind are naturally formed to admire. Joined with the manly virtues, he should, at the same time, possess strong and tender sensibility to all the injuries, distresses, and sorrows of his fellow-creatures; a heart that can easily relent; that can readily enter into the circumstances of others, and can make their case his own. A proper mixture of courage, and of modesty, must also be studied by every public speaker. Modesty is essential; it is always, and justly, supposed to be a concomitant of merit; and every appearance of it is winning and possessing. But modesty ought not to run into excessive timidity. Every public speaker should be able to rest somewhat on himself; and to assume that air, not of self-complacency, but of firmness, which bespeaks a consciousness of his being thoroughly persuaded of the truth, or justice, of what he delivers; a circumstance of no small consequence for making impressions on those who hear. Next to moral qualifications, a fund of knowledge is most necessary to an orator. This is much inculcated both by Cicero and Quintilian; "Quod omnibus disciplinis et artibus debet esse instructus orator," thus intimating that he should have a liberal education, and be formed for his office by a regular study of philosophy and the polite arts. Good sense and knowledge are, indeed, the foundation of good speaking. He who is to plead at the bar must make himself thoroughly master of the know-

ledge of the law; of all the learning and experience that can be useful in his profession, for supporting a cause or convincing a judge. He, who is to speak from the pulpit, must apply himself closely to the study of divinity, of practical religion, of morals, of human nature; that he may be rich in all the topics, both of instruction and persuasion. He who would fit himself for being a member of the supreme council of the nation, or of any public assembly, must be thoroughly acquainted with the business that belongs to such assembly; he must study the forms of court, the course of procedure; and must attend minutely to all the facts that may be the subjects of question or deliberation. But, besides the knowledge immediately belonging to his profession, a public speaker should extend his acquaintance with the general circle of polite literature. Moreover, without a habit of application and industry, it is impossible to excel in any thing; and much less to be a distinguished pleader, or preacher, or speaker in any assembly. Nothing can conduce so much to excite this kind of application as the honourable enthusiasm, or ardent attachment to the art in which excellence is sought for, which characterised the great men of antiquity. Another circumstance, that will greatly contribute to improvement, is attention to the best models; an attention very different from that slavish imitation, which depresses genius, or betrays the want of it; an attention, which will serve to correct and enlarge our own stock of ideas, and which will excite a laudable emulation to be distinguished in style, composition, and delivery. It should be remembered, while we are endeavouring to profit by models of eloquence, that the style of writing and that of speaking are different, and that the style of approved authors in writing discourses should not be transferred to popular orations. Among authors, whose manner of writing approaches nearer to the style of speaking than others, Dr. Blair mentions dean Swift, and lord Bolingbroke. Besides attention to the best models, those, who aspire to be distinguished orators, must accustom themselves to the exercise both of composing and speaking, as a necessary means of improvement. To all that has been already said on the best method of forming an accomplished orator, Dr. Blair directs the candidate for fame in this way to the study of critical and rhetorical writers, which will serve to aid his improvement in the practice of eloquence. He particularly recommends the original ancient writers. Aristotle, he says, by his comprehensive genius laid a foundation for all that was afterwards written on the subject; and he was the first who took rhetoric out of the hands of the Sophists, and introduced reasoning and good sense into the art. His "Treatise on Rhetoric" deserves attentive perusal. Two succeeding Greek rhetoricians still remain, though most of them are lost: these are Demetrius Phalereus and Dionysius of Halicarnassus; both have written on the construction of sentences and merit attention; especially Dionysius, who is a very accurate and judicious critic. It is needless, in this connection, to recommend the rhetorical writings of Cicero, and particularly his three books "De Oratore." But of all the ancient writers on the subject of oratory the most instructive and most useful is Quintilian; whose "Institutions" abound with good sense, and discover a very high degree of just and accurate taste; whilst they comprehend almost all the principles of good criticism. Ward and Blair, *ubi supra*.

ORATORIO, Ital. *Oratoire*, Fr. *Oratorium*, Lat. a sacred drama in Latin, or any national language, divided into scenes, and usually in three acts or parts, in imitation of theatrical pieces, but always written on sacred subjects, taken from scripture, or church history, and set to a grave

and solemn music, in order to be performed vocally, and instrumentally, in a church, or elsewhere, during Lent. This custom, says Rousseau, is inadmissible in France. French music is so undramatical, that it is enough to be allowed to expose itself in the theatres, without exhibiting its defects in the church. Rise and Progress of the sacred musical Drama, or Oratorio.

The first representation, or exhibition truly dramatic, that was performed in Italy, according to Apostolo Zeno, was a spiritual comedy, at Padua, 1243, 1244. (Bibl. Ital. p. 487.) Another Representation of the Mysteries of the Passion of Christ, &c. according to Muratori, was performed at Friuli, 1298. (Script. Rer. Ital. vol. xxiv. p. 1205.) In 1264, was instituted at Rome the Compagnia del Gonfalone, the statutes of which were printed in that city 1554, and of which the principal employment was to act or represent the sufferings of our Lord, in Passion-week, an institution which was long continued there. See Riccoboni's Reflex. hist. et crit. sur les differens Theatres d'Europe; et Trattato dell' Opera in Musica del Cavalier Planelli, § i. cap. 1.

According to Villani, Vasari, Cionacci, and Crescimbeni, *la rappresentazione sacra teatrale* had its beginning in Tuscany. (See Signorelli's Storia crit. de' Teatri, p. 189.) Tiraboschi, Storia della Letterat. Ital. tom. v. l. iii. cap. 3. claims the origin and invention of every species of drama for the Italians. However, the ingenious and agreeable author of the Biog. Dramatica, or Companion to the Playhouse, (Introd. p. 9.) observes, that "those who imagine the English to have been later in the cultivation of the drama than their neighbours, will, perhaps, wonder to hear of theatrical entertainments almost as early as the Conquest; and yet nothing is more certain, if we may believe an honest monk, one William Stephanides, or Fitz Stephen, in his Descriptio Nobilissimæ Civitatis Londinæ, who writes thus: London, instead of common interludes belonging to the theatre, has plays of a more holy subject: representations of those miracles which the confessors wrought, or of the sufferings, wherein the glorious constancy of the martyrs appeared. This author was a monk of Canterbury, who wrote in the reign of Henry II. and died in that of Richard I. 1191; and as he does not mention these representations as novelties to the people, for he is describing all the common diversions in use at that time, we can hardly fix them lower than the Conquest; and this, we believe, is an earlier date than any other nation of Europe can produce, for their theatrical representations."

Le Chant Royal was invented in France about 1380; it consisted of verses to the virgins and saints, sung in chorus by troops or companies of pilgrims returning from the holy sepulchre. Menestrier, des Représentations en Mus.

There were mysteries represented in Germany 1322. And in the same century, 1378, the ecclesiastics and scholars of St. Paul's school exhibited similar interludes in England.

But though every nation in Europe seems, in the first attempts at dramatic exhibitions, to have had recourse to religious subjects, and an oratorio, or sacred drama, is but a mystery or morality in music, yet those that were written before the seventeenth century seem never to have been entirely sung; but chiefly declaimed, with incidental airs and choruses. The late Rev. and learned Mr. Crofts, and the honourable Topham Beauclerc, in their curious libraries had collected a great number of these religious poems or mysteries, in Italian, of which we procured many of the most ancient, at the sale of their books, in order to trace the origin of the sacred musical drama. Some of them, by the gross manner in which the subjects are treated, the coarseness

of the dialogue, and ridiculous situation into which the most sacred persons and things are thrown, seem, though printed soon after the invention of the press, to be much more ancient than that discovery.

Gio Battista Doni (Trattato della Musica Scenica, c. vi. p. 15. Op. om. tom. ii. S. Giovanni e Paolo, one of the Collect. was written by Lorenzo il Magnifico: Santa Domitilla, and Santa Guglielma, by Antonia, wife of the poet Pulci, in the fifteenth century), speaking of oratorios, says that by a *spiritual representation* he does not mean that gross, vulgar, and legendary kind of drama used by the nuns and monks in convents, which deserve not the name of poetry; but such elegant and well constructed poetical fables as that of St. Alexis, by the ingenious Giulio Rospigliosi, many times represented, and always received with great applause. This oratorio, which is omitted in the Drammaturgia, though printed in score, in folio, 1634, was set to music by Stefano Landi, of the Papal chapel, and performed at the Barberini palace in Rome, on a stage, and in action, with dances, machinery, and every kind of dramatic decoration, of which a splendid account is given in a preface and letter prefixed to the work.

This description seems to comprehend the poetical virtues and vices of all ancient and modern religious dramas. The abbé Arnaud, in his *Essai sur le Theatre Anglois*, (Variétés Litt. tom. i. p. 29.), says that the fathers of the church in the first ages of Christianity, indulging the passion of the people for public spectacles, opposed religious dramas, built on the sacred writings, to the profane, which had been long used by the Pagans.

At the revival of theatrical amusements, when the reformers began to disseminate their doctrines throughout Europe, religious plays were made the vehicles of opinion, both by the Catholics and Protestants; and there are Latin dramas of this kind, as well as others in modern languages, extant, which might with propriety be called oratorios. At the beginning of the Reformation in England, it was so common for the defenders of the old and new doctrines to avail themselves of plays composed on subjects of scripture, in which they mutually censured and anathematized each other, that an act of parliament passed in the twenty-fourth year of Henry VIII. to prohibit the acting or singing any thing in these interludes contrary to the established religion. It appears, however, in Collyer's History of the Reformation, that after this period, the mysteries of the Roman Catholic religion were ridiculed by the Protestants, on a stage, in churches. It is related by Cardan, in his eulogy of our young king, Edward VI., that he had written a most elegant comedy, called *The Whore of Babylon*. The number of comedies, and tragi-comedies, written about this time, is incredible; they are, however, said to have been even more extravagant and gross, than numerous. One is entitled, *Jesus the true Messiah*, a comedy; another, *The new German Afs of Balaam*; the Calvinistical Postilion; the Christian Cavalier of Eislebn, a delectable, spiritual comedy, including the history of Luther and his two greatest enemies, the pope and Calvin; A pleasant comedy of the true old Catholic and Apostolic church, &c. *Storia Crit. de' Teatri*, p. 248.

The Conversion of St. Paul, performed at Rome, 1440, as described by Sulpicius, has been, erroneously, called the *first* opera, or musical drama. (Hist. de la Mus. tom. i. p. 241. and Menestrier, sur les Repres. en Mus.) Abram et Isaac suo Figliuolo, a sacred drama (*azione sacra*) "shewing how Abraham was commanded by God to sacrifice his son Isaac on the mountain," was performed in the church of St. Mary Magdalen in Florence, 1449. Another on the

same subject, called Abraham and Sarah, "containing the good life of their son Isaac, and the bad conduct of Ishmael, the son of his hand-maid, and how they were turned out of the house," was printed in 1556. Abele Caino, and Sampson, 1554; The Prodigal Son, 1565; and La Commedia Spirituale dell' Anima, "The Spiritual Comedy of the Soul," printed at Siena, but without date; in which there are near thirty personifications, besides St. Paul, St. John Chrysostom, two little boys who repeat a kind of prelude, and the announcing angel who always speaks the prologue in these old mysteries. He is called *l'angelo che nunzia*, and his figure is almost always given in a wooden cut on the title-page of printed copies. Here, among the interlocutors, we have God the Father, Michael the archangel, a Chorus of Angels, the human Soul with her guardian Angel, Memory, Intellect, Free-will, Faith, Hope, Charity, Reason, Prudence, Temperance, Fortitude, Justice, Mercy, Poverty, Patience, and Humility: with Hatred, Infidelity, Despair, Sensuality, a Chorus of Demons, and the Devil.

None of these mysteries are totally without music, as there are choruses and *laudi*, or hymns, that are sung in them all, and sometimes there was playing on instruments between the acts. In a play written by Damiano and printed at Siena, 1519, according to Crescimbeni, tom. i. p. 107, at the beginning of every act there was an octave stanza, which was sung to the sound of the lyra viol, by a personage called Orpheus, who was solely retained for that purpose; at other times a madrigal was sung between the acts, after the manner of a chorus.

It was, however, by small degrees that entire musical mysteries had admission into the church, or were improved into oratorios. All the Italian writers on the subject agree, that these sacred musical dramas had their beginning in the time of San Filippo Neri, who was born 1515, and founded the congregation of the Priests of the Oratory at Rome, in 1540. This saint, who died 1595, is numbered among Italian improvisatori, by Quadrio, tom. i. p. 163. He was originally intended for a merchant, but was drawn from commercial pursuits by Vocation. *Oratorio*, Ital. *Oratorium*, Lat. implies a small chapel, or particular part of a house or church, where there is an altar. The spaces between the arches of Roman churches, are called *Oratorii*, Ital. *Oratoires*, Fr. Anglicè chapels. The Congregation of the Oratory, established at Rome, and in some other cities of Italy by S. Phil. Neri, about 1558, originated from the conferences which this pious ecclesiastic held in his own chamber at Rome. The great number of persons who attended these meetings obliged St. Phil. to request the administrators of the church of San Girolamo della Carità to grant permission to hold these assemblies there, which was granted. In 1574, they were transferred to the church of the Florentines; and in 1583 to Santa Maria della Vallicella. By degrees this establishment spread itself all over Italy, where it has still many houses. The members are bound by no vow. Dict. des Cultes Relig.

It appears that these fathers, in whatever city of Italy they had an establishment, entertained their congregations with good music. During the service, and after sermon, it was usual for them, among other pious exercises, in order to draw youth to church, and keep them from secular amusements, to have hymns, psalms, and other spiritual *laudi*, or songs, sung either in chorus, or by a single favourite voice, divided into two parts, the one performed before the sermon, and the other after it.

But though this devout practice was begun in so simple a manner, with only spiritual cantatas, or songs, on moral subjects; in order to render the service still more attractive,

some sacred story or event from scripture was written in verse, and set by the best poets or musicians of the times. These being composed in dialogue, and rendered interesting to the congregation, such curiosity was excited by the performance of the first part, that there was no danger during the sermon that any of the hearers would retire, before they had heard the second.

The subjects of these pieces were sometimes the good Samaritan; sometimes Job and his friends; the prodigal son; Tobit with the angel, his father and his wife, &c. All these, by the excellence of the composition, the band of instruments, and the performance, brought this oratory into such repute, that the congregations became daily more and more numerous. And hence this species of sacred musical drama, wherever performed, in process of time, obtained the general appellation of oratorio. In the church of San Girolamo della Carita at Rome, oratorios are still constantly performed on Sundays and festivals from All Saints Day till Palm Sunday; as well as in the church of La Vallicella, or la Chiesa Nuova, where they are likewise performed from the first of November till Easter; Oratorj in Musica, e sermoni, every evening on all festivals. (See Roma moderna by Venuti, 1766, p. 207.) These are the two churches in which such spiritual spectacles had their beginning; but the practice has since been so much extended to the other churches of Rome, that there is not a day in the year on which one or more of these performances may not be heard. And as lists of oratorios and other *Funzioni* to be performed in the several churches in the course of the year are published, like our lists of Lent preachers, great emulation is excited in the directors and performers, as well as curiosity in the public. The first collection of the words of hymns and psalms, sung in the chapel of San Filippo Neri, was published at Rome 1585, under the title of *Laudi spirituali stampate ad istanza de' R. R. P. P. della Congregatione dell' Oratorio*. The second in 1603: *Laudi spirituali di diversi, solite cantarsi dopo Sermoni da' P. P. della Cong. dell' Oratorio*; among these were dialogues, in a dramatic form. (Crescimbeni, *Introd. all' Ist. della Volg. Poesia*. vol. i. lib. iv. p. 256.) See MYSTERIES and MORALITIES, which were often dramatized and formed into oratorios for convents and churches, and performed on festivals.

ORATORY is the art of speaking well, upon any subject, in order to persuade; and to speak well, as Cicero explains it, is to speak justly, methodically, floridly, and copiously. In which sense the word imports the same with *rhetoric*; the difference between the two only consisting in this, that one is taken from the Greek language, and the other from the Latin. However, the case is not precisely the same with the words *rhetorician* and *orator*. For although the Grecians used the former to express both those who taught the art, and such as practised it; yet the Romans afterwards, when they adopted that word into their language, confined it to the teachers of the art, and called the rest *orators*.

Lord Bacon defines rhetoric, or oratory, to be the art of applying and addressing the dictates of reason to the fancy, and of so recommending them as to affect the will and desires. The end of rhetoric, he observes, is to fill the imagination with ideas and images, which may assist nature, without oppressing it.

Vossius defines rhetoric, the faculty of discovering what every subject affords of use for persuasion. Hence, as every author must invent arguments to make his subjects prevail; dispose those arguments, thus found out, in their proper places; give them the embellishments of language proper to the subject; and, if this discourse be for public delivery, utter them with that decency and force which may strike the

hearer; *rhetoric*, or *oratory*, becomes divided into four parts, viz. *invention*, *disposition*, *elocution*, and *pronunciation*; which see respectively.

As to the history of oratory, the first invention of it is ascribed by the Egyptians, and fables of the poets, to Mercury. Quintilian observes, with respect to the origin of this art, that we derive the faculty of speech from nature; but the art from observation; and that men, perceiving that some things in discourse are said to advantage, and others not, accordingly marked those things, in order to avoid the one, and imitate the other: and that they also added some things from their own reason and judgment, which being confirmed by use, they began to teach others what they knew themselves. But it is not known when this method of observation first took place. It is reasonable to believe, that the Greeks had the principles of this art so early as the time of Pittileus, whose nephew Theseus lived not long before the taking of Troy. And at this time Cicero thought it was in much esteem among them. After this period, there is a great chasm in the history of oratory: for Quintilian says, that afterwards Empedocles, who flourished about five hundred years after Troy was taken, is the first upon record who attempted any thing concerning it. About this time there arose several masters of this art, the chief of whom Quintilian has enumerated; as Corax and Tisias, of Sicily; Gorgias, of Leontium, in the same island, the scholar of Empedocles; Thrasymachus, of Calcedon; Prodicus, of Cea; Protagoras, of Abdera; Hippias, of Elis; Alcidas, of Elca; Antiphon, who first wrote orations; Polycrates, and Theodorus of Byzantium. Nor should we omit Plato, whose elegant dialogue, entitled *Gorgias*, is still extant. To these succeeded Isocrates, the most renowned of the scholars of Gorgias, extolled by Cicero as the greatest master and teacher of oratory; Aristotle, whose system of oratory is esteemed the best and most complete of any in the Greek language; Demosthenes, who was an auditor of Isocrates, Plato, and Isæus, and who has been esteemed by the best judges the prince of Grecian orators; Æschines, who taught rhetoric at Rhodes; Theodectes and Theophrastus, disciples of Aristotle; Demetrius Phalereus, scholar of Theophrastus; Hermagoras; Athenæus; Apollonius Molon; Areus Cæcilius; Dionysius, of Halicarnassus; Apollonius, of Pergamus; and Theodorus of Gada. Of these there now remains nothing upon the subject of oratory, except some tracts of Dionysius, who flourished in the reign of Augustus Cæsar. After the time of Quintilian we may mention Hermogenes, and Longinus, the author of the excellent treatise "*Of the Sublime*."

This art was introduced late, and with difficulty among the Romans. In the year of their city 592, when, by the industry of some Grecians, the liberal arts began to flourish in Italy, a decree passed the senate, by which all philosophers and rhetoricians were ordered to depart out of Rome: but in a few years after, on the arrival of certain ambassadors, viz. Carreades, Critolaus, and Diogenes, who were orators as well as philosophers, from Athens to Rome, the Romans were so charmed with the eloquence of their harangues, that they could no longer be restrained from pursuing the study of oratory. According to Seneca, Lucius Plotius, a Gaul, was the first who taught the art of oratory, at Rome, in Latin, and the first Roman who engaged in it was Blandus, of the equestrian order; and he was soon succeeded by others; some of whose lives are yet extant, written by Suetonius, as many of the Grecians are by Philostratus and Eunapius. The writers on this art, enumerated by Quintilian, were M. Cato, the censor, and after him Anthony, the orator; but he who carried eloquence to its highest pitch

was Cicero, who has likewise, by his rules, given the best plan, both to practise and teach the art. He also mentions Cornificius, Stertinius, Gallio the father, Celfus, Lenas, Virginius, Pliny, and Rutilius.

Quintilian himself deserves the highest commendation for diligence and accuracy as a writer; of whom St. Jerom says, that he was the first who taught publicly at Rome, and received a salary from the treasury. This he places in the eighth year of Domitian; whereas Suetonius informs us, that Vespasian was the first who granted out of the treasury a yearly salary of near 800*l.* sterling, to the Latin and Greek rhetoricians. Since the revival of learning, there has been a great number of writers, who have treated on the subject of oratory, and contributed to the perfection of it, both in theory and practice.

Having rapidly enumerated the principal orators of antiquity, both in Greece and Rome, we shall now mention some peculiar circumstances which contributed at different periods and in different countries to call forth into exercise their powers of eloquence, and to give them their celebrity. Eloquence, or oratory, being the art of speaking in such a manner as to attain the end for which we speak, its power will chiefly appear when it is employed to influence conduct, and to persuade to action; and in this view it may be concisely defined, "the art of persuasion." A popular writer has distinguished three kinds, or degrees, of eloquence; for an account of which, see ELOQUENCE. It has been observed by several authors, that eloquence is to be looked for only in free states. This observation is appropriately and beautifully illustrated by Longinus. Liberty, he says, is the nurse of true genius; it animates the spirit, and invigorates the hopes of men; excites honourable emulation, and a desire of excelling in every art. All other qualifications you may find among those who are deprived of liberty; but never did a slave become an orator; he can only be a pompous flatterer. These observations, under certain limitations, are justified by history and observation. For although under arbitrary governments, that are civilized, and that encourage the arts, ornamental eloquence may flourish, that eloquence which is calculated more to soothe and please, than to convince and persuade; yet high, manly, forcible eloquence is to be looked for only, or chiefly, in the regions of freedom. Eloquence, or the art of persuasion, took its rise with that of the Grecian republics. The flourishing period of the Grecian states lasted from the battle of Marathon till the time of Alexander the Great, who subdued the liberties of Greece. This period comprehends about 150 years, and within it are to be found most of their poets and philosophers, but chiefly their orators. Of these Grecian republics the most noted for eloquence, as well as for arts of every kind, was that of Athens. The genius of the government of the Athenians was democratical, and affairs were conducted among them by reasoning and speaking, and by a skilful application to the passions and interests of a popular assembly.

In such a state, and among such a people, eloquence, that kind of eloquence which was most effectual for convincing, interesting, and persuading the hearers, would be much studied, as the surest means of rising to influence and power. Pisistratus, who was contemporary with Solon, and subverted his plan of government, is mentioned by Plutarch as the first who distinguished himself among the Athenians by application to the arts of speech; and in this way he rose to the sovereign power. Of succeeding orators we have no particular account till the commencement of the Peloponnesian war, when Pericles appeared, and carried eloquence to a great height; to such a height that he was never after-

wards surpassed. His eloquence was so forcible and vehement, that it triumphed over the passions and affections of the people; and he was therefore called Olympius, and is said, like Jupiter, to have thundered when he spoke. Suidas mentions one remarkable circumstance relating to Pericles, that he was the first Athenian who composed, and put into writing, a discourse designed for the public. After Pericles, in the course of the Peloponnesian war, arose Cleon, Alcibiades, Critias, and Theramenes, eminent citizens of Athens, who, though not orators by profession, were all distinguished for their eloquence. The style of oratory which then prevailed, appears from the orations in the history of Thucydides, who flourished in the same age; it was manly, vehement, and concise, approaching even to some degree of obscurity. After the days of Pericles, the reputation and influence which the powers of eloquence acquired, gave birth to a set of men, called Rhetoricians, or Sophists, who appeared in great number during the Peloponnesian war; such were Protagoras, Prodicus, Thrasymus, and Gorgias. These men professed the art of giving receipts for making all sorts of orations, for or against any cause whatever. They were the first who, with this view, treated of common places, and the artificial invention of arguments and topics for every subject. Accordingly they may be justly deemed the first corruptors of true eloquence; and they were opposed by Socrates, who endeavoured to explode their sophistry. In the same age with the philosopher just mentioned, flourished Isocrates, whose writings are still extant. As a professed rhetorician he acquired a great fortune and higher favour than any of his competitors, by teaching eloquence. His orations abound with morality and good sentiments; they are flowing and smooth; but too destitute of vigour. For a further account of him, see his biographical article. To this period belong also Isæus and Lyfias. (See their articles.) The former is distinguished for being the master of Demosthenes, who raised eloquence to a higher degree of splendour than any other person who ever bore the name of an orator. For the circumstances of his life, and the character of his eloquence, particularly compared with that of Cicero, and contrasted against that of Æschines, see his biographical article. After the days of Demosthenes, Greece lost her liberty, and eloquence of course languished and relapsed again into the feeble manner introduced by the rhetoricians and sophists. Demetrius Phalereus, who lived in the next age to Demosthenes, attained some character, but he is represented as a flowery rather than a persuasive speaker, who aimed at grace rather than substance. "He amused the Athenians," says Cicero, "rather than warmed them." After his time we hear of no more Grecian orators of any note.

If we advert to the rise and progress of eloquence among the Romans, we shall find that they were long a martial nation, altogether rude, and unskilled in arts of any kind. The Romans always acknowledged the Grecians as their masters in every part of learning. To this purpose Horace speaks of them in his *Epist. ad Aug.*

"When conquer'd Greece brought in her captive arts,
She triumph'd o'er her savage conquerors' hearts;
Taught our rough verse its numbers to refine,
And our rude style with elegance to shine."

Francis.

As the Roman government, during the republic, was of the popular kind, public speaking became at an early period an engine of government, and was employed for gaining distinction and power. But in the rude unpolished times of the state, their speaking could hardly be deemed eloquence.

quence. It was not till a short time preceding the age of Cicero, that the Roman orators rose into any note. Crassus and Antonius, to whom we may add Hortensius, appear to have been the most eminent. Cicero has described the character of their eloquence. Cicero himself is at this period the object most worthy of our attention; and his name alone suggests every thing that is splendid in oratory. For his character as an orator, we refer to his biographical article. The reign of eloquence, among the Romans, was very short. After the age of Cicero, it not only long languished but expired: nor need we wonder that this should be the case. For not only was liberty entirely extinguished, but arbitrary power was felt in its heaviest and most oppressive weight: Providence having in its wrath delivered over the Roman empire to a succession of some of the most execrable tyrants that ever disgraced and scourged the human race. The change which was produced in eloquence by the nature of the government and the state of the public manners, is beautifully described in the dialogue "*De Causis corruptæ Eloquentiæ*," attributed by some to Tacitus, by others to Quintilian. In the schools of the declaimers, the corruption of eloquence was completed. Thus, with the Greek rhetoricians, the manly and sensible eloquence of their first noted speakers degenerated into subtlety and sophistry; and among the Roman declaimers, it passed into the quaint and affected; into point and antithesis. This corrupt manner begins to appear in the writings of Seneca; and shews itself also in the famous panegyric of Pliny the Younger on Trajan, which may be considered as the last effort of Roman oratory. In the decline of the Roman empire, the introduction of Christianity gave rise to a new species of eloquence, in the apologies, sermons, and pastoral writings of the fathers of the church. Among the Latin fathers, Lactantius and Minutius Felix are the most remarkable for purity of style; and in a later age, the famous St. Augustine possesses a considerable share of sprightliness and strength. But none of the fathers afford any just models of eloquence. Among the Greek fathers, the most distinguished, in a high degree, for his oratorical merit, is St. Chrysostom. See his biographical article.

In modern times, and even in Great Britain, we are unquestionably inferior, in a variety of respects, to the Greeks and Romans. They aspired to a more sublime species of eloquence than the moderns. Theirs was of the vehement and passionate kind; that of the moderns is much more cool and temperate; and in our country especially, it has confined itself almost wholly to the argumentative and rational. The reasons of this change are detailed by Dr. Blair in his *Lectures*, &c. vol. ii.

We shall close this article with observing, in the words of a very good judge, that the method of forming the best system of oratory is to collect it from the finest precepts of Aristotle, Cicero, Quintilian, Longinus, and other celebrated authors; with proper examples taken from the choicest parts of the purest antiquity. On this plan, the learned Dr. Ward has formed his system, to which we refer the reader, and on the subject of this article to his first lecture, vol. i. Concerning the distribution of the subject of oratory, and different kinds of orations, see ORATION.

ORATORY is also used, among the Romans, for a closet, or little private apartment, in a large house, near a bed-chamber, furnished with a little altar, and a book-stand for private devotion.

The ancient oratories were little chapels, adjoining to monasteries, wherein the monks said prayers, before they had any churches. Several councils and synods have condemned the use of private oratories.

In the sixth and seventh centuries, oratories were little churches, frequently built in burial-grounds, without either baptistery, cardinal priest, or any public office; the bishop sending a priest to officiate occasionally.

ORATORY is also used for a society or congregation of devout persons, who form a kind of monastery, and live in community; but without being obliged to make any vows. Hence,

ORATORY, *Priests of the*, a community of secular priests, who live together in a monastic manner, but without vows. They were first established at Rome, about the year 1540, by St. Philip Neri, a Florentine, under the title of "*Oratory of Sancta Maria in the Valicella*."

The name of this religious society was derived from an apartment, accommodated in the form of an oratory, or cabinet for devotion, which S. Philip Neri built at Florence for himself, and in which for many years he held spiritual conferences with his more intimate companions.

On the model of this the cardinal Berulle established a congregation of the Oratory of Jesus, in 1613, in France, which has since increased: so that there arose sixty houses of Priests of the Oratory, in that kingdom.

The fathers, or Priests of the Oratory, are not, properly speaking, religious or monks, being bound by no vows, and their institute being purely ecclesiastical or sacerdotal.

There is some difference, however, between the Italian and French institutions. S. Philip Neri, to prevent the confusion which the great number of houses usually occasioned in congregations, would have his to be a single house: and though others were at liberty to form the like congregations, yet they were to have no dependence on one another.

For this reason, the houses of the Oratory, in Italy and Flanders, are all independent; whereas, those in France have a relation to each other, and all depend on the same chief, who has the quality of superior-general; and, with three assistants, governs all the congregations.

ORAVAIS, in *Geography*, a town of Sweden, in East Bothnia; 22 miles N. of Wasa.

ORAWITZA, a river of Hungary, which runs into the Waag; 9 miles N. of Arva.

ORAYOI, a town of New Mexico; 150 miles W. of Santa Fé.

ORB, ORBIS, in *Astronomy*, a spherical body or space, contained under two superficies; the one concave the other convex.

The ancient astronomers conceived the heavens as consisting of several vast azure transparent orbs or spheres, inclosed in one another; or vast circles, which in their areas included the bodies of the planets; the radii of which were comprised between the centre of the earth, and the highest point to which the planets rise, supposing the earth to be in the centre.

There are orbs *concentric*, i. e. having the same centre; and orbs *eccentric*.

The *magnus orbis*, or great orb, is that in which the sun is supposed to revolve; or, rather, it is that in which the earth makes its annual circuit.

ORB, in *Astrology*. An orb of light is a certain sphere, or extent of light, which the astrologers allow a planet beyond its centre.

They say, that, provided the aspects do but fall within this orb, they have almost the same effect as if they pointed directly against the centre of the planet. See ASPECT.

The orb of Saturn's light they make to be 10 degrees; that of Jupiter 12 degrees; that of Mars 7 degrees 30 minutes; that of the Sun 17 degrees; that of Venus 8 de-

grees; that of Mercury 7 degrees; that of the Moon 12 degrees 30 minutes.

ORB, in *Pointed Architecture*, the same as knot or boss. See KNOT.

ORB, in *Tactics*. See Round BATTALION.

ORB, in *Geography*, a river of France, which rises in the N. part of the department of the Allier; 8 miles N.W. of Lodeve, and runs into the Mediterranean, 8 miles below Beziers.

ORBE, a river of Switzerland, which rises in mount Jura, passes the lake of Neuchâtel and Bienne, and runs into the Aar; 3 miles W. of Buren, in the canton of Berne.—Also, a town of Switzerland, in the canton of Berne, situated on the above river. According to antiquaries, this was the most ancient town, and once the most powerful of all Helvetia: it was called "Urbâ," and was the capital of the "Pagus Urbigenus;" but it has no remains of its ancient splendour. Some antique fortifications, an old castle, and a round tower, are probably works of later times, when this country was divided into a number of feudal sovereignties. The situation of the town is romantic; its single-arched bridge projecting over the Orbe, the wild scenery on the banks of this river, the frequent cataracts, and the picturesque view in the environs, are all interesting objects. Orbe, which is governed by its own magistrates, is comprised within the bailliage of Echallons, belonging to Berne and Fribourg. In this town is an infirmary, formed by M. Venel, an eminent surgeon, for the reception of persons with distorted limbs. Venel has contrived a machine to embrace the patient's limbs when in bed, and which is constructed so as to act without disturbing their rest. This contrivance, it is said, has performed many cures; 5 miles S.W. of Yverdon.—Also, a town of Germany, celebrated for its salt-works; 26 miles E. of Frankfort on the Maine.

ORBEC, a town of France, in the department of the Calvados, and chief place of a canton, in the district of Lisieux; 10 miles S.E. of Lisieux. The place contains 3600, and the canton 15,047 inhabitants, on a territory of 180 kilometres, in 27 communes.

ORBICULAR LEAF, in *Botany*. See LEAF.

ORBICULARIS, in *Anatomy*, an epithet applied to the muscles which surround the openings of some organs; as the orbicularis oris or labiorum at the mouth. See DEGLUTITION, and EYE.

ORBICULARIS, in *Botany*, a name given by some authors to the arbutus, or cyclamen, called in English snow-bread. See CYCLAMEN.

ORBICULUS CILIARIS, in *Anatomy*, a circular adhesion between the choroid coat and sclerotic of the eye. See EYE.

ORBIEU, in *Geography*, a river of France, which rises in the department of the Eastern Pyrenées, and runs into the Aude, 5 miles N.W. of Narbonne.

ORBIGA, a river of Spain, which runs into the Duero, near Zamora, anciently called "Urbicus."

ORBION, a lake of the island of Corsica, near the sea, on the E. coast; 27 miles S.E. of Corte.

ORBIS, in *Ichthyology*, a species of *Chatodon*; which see.—Also, a name given to several species of *Diodon*; which see.

ORBIT, ORBITA, in *Astronomy*, the path of a planet or comet; or, the line described by its centre in its proper motion in the heavens.

The sun's, or rather the earth's orbit, is the curve which it passes along in its annual revolution; called the *ecliptic*.

The orbit of the earth, and that of all the primary pla-

nets, is an ellipsis, in one of whose foci the sun is placed; in which ellipsis they move according to this law, that a radius drawn from the centre of the sun to the centre of the planet, always describes areas proportional to the times.

The ancient astronomers made the planets describe circular orbits with an uniform velocity; Copernicus himself could not believe they should do otherwise. "Fieri nequit," says he, "ut cœleste corpus simplex uno orbe inæqualiter moveatur." So that, to account for their inequalities, they were obliged to have recourse to eccentrics and epicycles; from the embarrassment of which Copernicus could not entirely disentangle himself.

But after him came astronomers, who, with a little more physics, have made no difficulty of changing these circular orbits into elliptical ones: and of making them move with different velocities in different parts of these orbits.

Of these elliptic orbits, there have been two kinds assigned; the first that of Kepler, which is the common ellipsis; to which Seth Ward, though he himself keeps to it, thinks one might venture to substitute circular orbits, by using two points, taken at equal distances from the centre, on one of the diameters, as they do in the foci of the ellipsis. The second is that of M. Cassini, whose character is this; that the products of the right lines, drawn from each point of its circumference, are every where equal; whereas, in the common ellipsis, it is the sum of those right lines that is always the same. M. Varignon shews how inconsistent Copernicus's sentiment is with the mechanism of the heavens: since the forces which planets have, to retain them in their orbits, must almost always conspire to make them move with really different velocities: and that, among an infinity of cases, there is but one in which they can move uniformly.

The semidiameter of the earth's orbit is now stated to be 94,696,969 miles English, and the semidiameter of Saturn's orbit about ten times as great.

The orbits of the planets are not all in the same plane as the ecliptic, or the earth's orbit round the sun; but are variously inclined to it, and to one another: but still the plane of the ecliptic intersects the plane of the orbit of every planet in a right line, which passes through the sun. See PLANET.

The orbits of comets Cassini takes to be rectilinear; but they are now known to be very eccentric ellipses. See COMET.

ORBITARIA FORAMINA, in *Anatomy*, two small holes on the inner side of the orbit. See CRANIUM.

ORBITELLO, in *Geography*, a town of the Siennese, but belonging to Naples; situated on the E. side of a lake, near the coast of the Mediterranean, with a good harbour, and well fortified; 65 miles N.W. of Rome. N. lat. 42° 31'. E. long. 11° 6'.

ORBONA, in *Mythology*, a goddess worshipped at Rome, who was invoked in behalf of orphans, or to comfort fathers and mothers for the loss of their children.

ORBOZ, in *Geography*, a town of Great Bucharia, on the Baman; 15 miles S. of Balk.

ORBY, a town of Sweden, in West Gothland; 28 miles E.S.E. of Gotheborg.

ORCHAMPS, a town of France, in the department of the Jura; 9 miles W. of Quingey.

ORCHAMPS en Vennes, a town of France, in the department of the Doubs; 15 miles E. of Ornans.

ORCHAN, in *Biography*, son of Othman, the founder of the Ottoman dynasty, distinguished for his valour, reduced,

duced, during the reign of his father, the important city of Prusa, or Bursa, the capital of Bithynia. On the death of Othman, in 1326, Orchan was declared his successor on the Turkish throne. "From the conquest of Prusa," says the historian, "we may date the true era of the Ottoman empire. The lives and possessions of the Christian subjects were redeemed by a ransom of thirty thousand crowns of gold; and the city, by the labours of Orchan, assumed the aspect of a Mahometan capital. Prusa was decorated by a mosque, a college, and an hospital of royal foundation; the Seljukian coin was changed for the name and impression of the new dynasty; and the most skilful professors of human and divine knowledge, attracted the Persian and Arabian students from the ancient schools of Oriental learning. Orchan nominated his brother Aladin for his vizier, and he next introduced great improvement into his army. In the second year of his reign he took the city of Nicomedia, by means of a newly invented train of battering engines: and soon after made himself, by the same means, master of Nice. Orchan granted a safe-conduct to all who were desirous of departing with their families and effects, but the widows of those who were slain in defending their cities, were given in marriage to the conquerors, and the sacrilegious plunder was sold and ransomed at Constantinople. Orchan subdued the whole province or kingdom of Bithynia, as far as the shores of the Bosphorus and Hellespont; and the Christians confessed the justice and clemency of a reign which claimed the voluntary attachment of the Turks of Asia. Yet Orchan was content with the modest title of emir, and in the list of his compeers, the princes of Roum or Anatolia: his military forces were surpassed by the emirs of Ghernian and Caramania, each of whom could bring into the field an army of 40,000 men." Orchan having formed an alliance with John Cantacuzenus, great domestic of the Constantinopolitan court, and afterwards emperor, he adopted his interest in the civil dissensions of that capital, and at length demanded one of his daughters in marriage. Notwithstanding the difference of religion and manners, the circumstances of the empire did not permit a refusal, and Theodora was given to Orchan with great solemnity. After the resignation of Cantacuzenus, the bands of alliance between the Greek and Turkish emperors being dissolved, Solyman, son of Orchan, openly invaded Thrace, and made himself master of Gallipoli, the key of the Hellespont. The young man was soon after killed by accident, while exercising his troops, and Orchan was so much affected by the loss of his son, that he soon followed him to the grave. This event happened in the year 1360, when he was about seventy years of age. The piety and justice of this prince are greatly extolled by Turkish historians. They say that he daily conversed with the learned, and would undertake nothing of moment without their advice and sanction: and he was the first of their monarchs who founded schools and hospitals. He certainly deserves to be regarded as one of the principal founders of the Ottoman greatness. *Univer. Hist. Gibbon, vol. xi.*

ORCHARD, in *Gardening*, a portion of garden ground set apart for the growth of the different sorts of the more common kinds of fruit, but chiefly that of the apple kind. The trees in this case are mostly of the standard kind, especially when large supplies of fruit are wanted, and generally consist of apple-trees, pear-trees, plum-trees, and cherry-trees; and, to render the orchard more complete, it should contain quinces, medlars, mulberries, service-trees, filberts, Spanish nuts, and barberries, as well as walnuts and chefnuts. As the two last sorts are well adapted for sheltering the others from high winds, they should, Mr. Forsyth thinks, be

planted in the boundaries of the orchard, a little closer than ordinary for that purpose.

In providing trees, especially of the apple kind, for this purpose, too much care cannot be taken to admit of none but such as have good roots, fair clean stems, and proper heads; and at the same time attention should be paid that a proper assortment of the different sorts be procured for the supply of the table during the whole year. A few of the summer sorts are sufficient, but more of the autumn, and still a larger quantity of the winter kind will be necessary; as upon this last sort the chief dependence must be placed, from the beginning of the year till nearly the period of the fruit being ready again.

In districts where the process of cider-making is conducted upon a large scale, large orchards of apples only are often met with; and in some counties, as Kent, there are orchards wholly of cherries, or of these and filberts. In general, however, there ought to be a much larger proportion of apples than of any other fruit in orchards, as in proper situations they are very profitable; and, in addition, the trees have a delightful appearance when in blossom, as well as when the fruit is ripe.

Situation and Soil.—In respect to situation, an orchard should rather be elevated than low, as on a gentle declivity, open to the south and south-east, to give free admission to the air and rays of the sun, as well as dry up the damps and disperse the fogs, in order to render the trees healthy, and give a fine flavour to the fruit. It should likewise be well sheltered from the east, north, and westerly winds, by suitable plantations, where not naturally sheltered by hills or rising grounds. Such plantations, when they consist of forest-trees, should neither be too large nor too near the orchard; as where that is the case, they prevent a free circulation of air, which is injurious to the trees. Where the ground does not admit of such plantations, Mr. Forsyth advises planting cross rows of fruit-trees, in the manner directed in gardens, as well as some of the largest growing trees, nearest the outsidings exposed to those winds, two or three rows of which should be planted closer than ordinary, which would greatly shelter those in the interior parts of the orchard, and be of great service, in addition to the walnut and chefnut trees, as mentioned above.

Orchards are planted on many different sorts of soil, and succeed well; but a dry, friable loam is probably the most suitable, as trees of this sort are impatient of moisture. Such as have been mentioned for gardens will answer perfectly well, and such as produce good crops of corn, grass, or other vegetables, are mostly proper for an orchard; and though the above sort is to be preferred, that of a good quality, not too light or dry, nor wet, heavy, or stubborn, but of a moderately soft and pliant quality, will be found to answer the end perfectly. The shingly and gravelly soils disagree very much with fruit-trees, unless there be loam intermixed with them. They succeed much better on a chalk bottom, or subsoil. On such a soil Mr. Forsyth has seen roots twelve feet deep, and the trees thrive well. Where the bottom is clay, the roots should be cut-in once in four years, to prevent them from penetrating the clay, which would greatly injure the trees. Whatever the nature of the soil may be, it should have a good depth, as two or three feet. Where the soils are wet, they should be well drained, in the same manner as directed for gardens; or by forming the land in ridges, with furrows between the rows to convey off the moisture, the turf being re-laid in case of the ground being in the state of fward.

Form and Size.—In regard to the size of an orchard, it may vary from one to ten and fifteen or more acres, according

ing to the quantity of fruit wanted, or the proportion of ground that is fit for the purpose. The best form is that of the square where it can be had, but other forms answer very well.

Preparation.—This is effected in different ways; but the best method is, probably, before planting the trees, to trench it two spits deep, and ten feet broad, where the rows are to be planted, and to loosen a spit below, unless it be clay, which should, Mr. Forfyth says, be trodden down. Where the ground is in pasture, it should be ploughed, and well summer-fallowed, till the grafs be killed, otherwise when it is laid in the bottom in trenching, which it generally is, it will be very apt to breed grubs, which do much mischief. In bad shingly or gravelly soils, he recommends that holes should be dug at least three feet deep, and filled up with good mould: if mixed up with rotten dung, rotten leaves, or other manure, the trees will in time amply repay the expence: the dung used for this purpose should be that from the melon and cucumber beds, mixed with the mould from the same, when the beds are broken up in autumn, or winter; and be laid up in heaps, and continued so for one year at least; but be frequently turned, and have some good fresh mould mixed with it. It is the practice with some to only dig holes large enough to receive the roots, especially in grafs-ground, which is to be continued so. Others prepare the ground by deep ploughing, if the orchard is to be of great extent. The sward, if pasture, should be ploughed in some time in spring; a good summer-fallow should be given it, ploughing it two or three times, which will rot the turf. A fortnight or three weeks before planting, it should have a good deep ploughing, to prepare it for the reception of the trees. In Kent, and some other hop districts, they prepare their orchard-ground, by the growth of hops upon it with the fruit-trees, by which they are much protected and brought forward.

Season of Planting.—In relation to the period of planting, it may be performed with success at different seasons, according to the nature of the land. The best time for planting on a dry soil is, Mr. Forfyth says, in October; but, if wet, the latter end of February, or the month of March, will be a more fit season. The chief circumstances in this business is to suit the trees as much as possible to the soil, and to plant them at proper distances from each other; which may be from forty to eighty feet, according to the size of the trees when full grown. He observes that fruit-trees, when planted too thick, are very liable to blights, and to be covered with moss, which robs them of a great part of their nourishment, besides spoiling the flavour of the fruit. The distance should be regulated by the nature of the orchard in a great degree.

Procuring the Trees.—In providing the trees, it is a good practice to procure them from a soil nearly similar to, or rather worse than, that where they are intended to be planted; as trees transplanted from a rich soil to a poorer one never thrive so well; but if from a poor to a richer soil, they generally succeed in a perfect manner. Good trees, which have been properly pruned, which are quite free from bruises and disease, should always be carefully selected; and their roots be preserved as much as possible when taken up.

The most proper sorts of trees for small orchards may be those of the janeting, golden pippin, nonesuch, Ribston pippin, nonpareil, queen, sky-house, golden rennet, aromatic pippin, grey Leadington, scarlet pearmain, lemon pippin, pomegrife, French crab, ruffeting, and codling kinds. But various other sorts may be employed where the orchards are extensive, and a great variety of fruit necessary.

Planting the Trees.—With regard to the proper distance

of planting the trees, it should be regulated by the natural growth or spreading of them when fully grown, as well as the nature and goodness of the soil. It was formerly the practice to have them put in at narrow distances; but at present ten, twelve, or fifteen yards are more common, and in the cider districts from twenty to twenty-five yards are in use. The usual mode of arranging the trees is, in open grounds in lines or rows; but in close plantations the quincunx method is more in use. In the row method, when it can be done, they should be in the direction of north and south, or one point more to the east, as by this means they will have the advantage of the sun from the early part of the morning, in the spring season, which will in a great measure prevent the damp fogs from hanging upon them, and hindering the due increase of the fruit.

In the act of planting or putting them into the ground, great care should be taken that they are not put in too great a depth, as where that is the case they are in great danger of being destroyed. It is also necessary that a bed of fine good mould be provided for them, and that it be carefully put in with them, so as to be properly insinuated among the fibres of the roots, and afford them due support; the whole being carefully trodden round the plants in finishing the business. Upon this being performed in a proper and perfect manner, and the young trees afterwards kept perfectly steady by suitable supports, the success of the planter in a great measure depends.

Where the trees are planted in the quincunx order, and at the distance of eighty feet, Mr. Forfyth says, the ground between the rows may be ploughed and sown with wheat, turnips, &c. or planted with potatoes: the ploughing or digging the ground, provided it be not done so deep as to hurt the roots, by admitting the sun and rain to meliorate the ground, will keep the trees in a healthy flourishing state. It will be necessary to support the young trees by tying them to stakes until they are well rooted, to prevent their being loosened or blown down by the wind.

In the spring, after planting, if it prove dry, some turf should be dug and laid round the stems of the young trees, with the grassy side downwards; which will keep the ground moist, and save a deal of watering: if the trees have taken well, this need not be repeated, as they will be out of danger the first year. The turf should be laid as far as the roots of the trees are supposed to extend; and when it is rotted, it should be dug in, which will be of great service to their roots.

Such trees as are of very different sizes when full grown, should not be planted promiscuously; but, if the soil be properly adapted, the larger planted in the back parts or higher grounds, or at the north end of the rows, if they run nearly north and south, and the others in succession, according to their size. The trees, when planted in this manner, will have a fine effect when grown up; but if they are planted promiscuously, they will not appear so agreeable to the eye; and, besides, the smaller trees will be shaded by the larger, which injures them, and spoils the flavour of the fruit.

It is advised that orchards should be dunged once in two or three years with some sort of good manure, as this is of much advantage in rendering them fruitful and productive.

The stems of the trees in those where cattle feed, should be high enough to prevent their eating the lower branches; and fenced in such a manner as to prevent their being barked, or injured by the cattle rubbing against them, particularly when young; which may be done by triangles of wood, or the trees may be bushed with thorns.

But in orchards where cattle are not permitted to go, Mr.

Forlyth prefers dwarf-trees to standards, taking care to proportion the distance of the rows to the size of the trees.

Management afterwards.—This chiefly consists in keeping the trees properly pruned and cut in; as where this is judiciously done, the trees will come into bearing sooner, and continue in vigour for nearly double the common time. But with these standard-trees less culture is necessary than in other cases. No branch should ever be shortened unless for the figure of the tree, and then it should be taken off close at the separation. The more the range of branches shoot circularly, a little inclining upwards, the more equally will the sap be distributed, and the better the tree bear. The ranges of branches should not be too near each other, that the fruit and leaves may not be deprived of their full share of sun; and where it fruits, the middle of the tree should be so free from wood, that no branch may cross another, but all their extremities point outwards.

About October or November, or as soon as the fruit is removed, is the most proper season for this work. It is the best practice to take off superfluous branches with a saw, and afterwards to smooth the place with a knife; for it is essential that every branch that is to come off should be cut perfectly close and smooth. The wounded part may then be smeared over with a proper composition. Such branches should always be taken off as come near to the ground, that have received any material injury, where the leaves are much curled, or that have a tendency to cross the tree, or run inwards. And a little attention may be given to the beauty of the head, leaving all the branches as nearly equidistant as possible. Where there are any remaining blotches, they should be opened or scored with a knife; and where the bark is ragged from any laceration, it should be pared gently down to the live wood: touching over each with a proper composition. This being done, the moss should be rubbed clean off, and the trees scored. In this last operation, care should be taken not to cut through the inner or white rind, which joins the bark to the wood. When trees are much thinned, they are subject to throw out a great quantity of young shoots in the spring, which should be rubbed off, and not cut, as cutting is apt to increase the number.

The great enemy to orchards where apples is grown, is mistletoe, and it is often permitted to become very injurious to them. The usual method of clearing trees from it, is to pull it out with hooks in frosty weather, when brittle, and readily broken off from the branches. A labourer is capable of clearing fifty or sixty trees in a day.

Moss, moist spring frosts, blights, and several other similar causes, are highly injurious to this sort of tree, as is shewn under these particular heads.

ORCHARDS, in *Husbandry*, such as are formed in fields for the purpose of affording the liquor called cider. These orchards are very extensive in many districts, and form the chief part of the produce of the countries where they exist. The manner of forming them is stated above. There are a great many varieties of apples and pears made use of in these orchards.

It is remarked in the Herefordshire Report on Agriculture, that the apple and pear-trees which form the orchards of that district, are well known not to be the natural production of any soil or climate, the one being a variety of the *pyrus malus*, or crab, and the other derived from the *pyrus communis*, or common wild pear; as such, neither of them are noticed by Linnæus. The native wild crab is subject to considerable

diversity in the appearance of its leaves, and in the colour, shape, and flavour of its fruit.

By selecting and cultivating the best of these, all our valuable varieties have been produced, and by repeated propagation have been preserved for the time. This principle was, it is said, clearly known by the ancients, whether they applied it to the apple or not; as is evident from Virgil. And it is added that Normandy, and other parts of the continent, have occasionally furnished this country with several of these artificial varieties. It is likewise stated, that the apple-trees are divided into *old* and *new* sorts; each class comprises some called *kernel* fruits, namely, the fruit growing on its native root, as a distinction from those produced by the operation of grafting.

The old sorts are the more valuable, and are those which have been long introduced, such as the *shire*, golden pippin, hagloe crab, several varieties of the *harvey*, the brandy apple, red streak, woodcock, moyle, gennet moyle, red, white, and yellow musks, paufon, fox-whelp, loan and old pearmain, Dymock red, ten commandments, and others. Some of these names are descriptive of the fruit, and others are derived from the places where they have been first found, or found in most abundance. The modern varieties derive their appellations from such various and capricious causes, that a correct list cannot be composed; in several instances, the same fruit bears a different name, even in the same parish. A regular and scientific classification of the whole would be, it is supposed, a valuable acquisition to our rural economy, and there are at this time persons of opulence and public spirit fully adequate to such an undertaking.

The pears held in most estimation, are the *squash*, so called from the tenderness of its pulp; the *old-field*, from having grown as a seedling in a field of that name: the *huff-cap*, from the quantity of fixed air contained in its liquor; the *bar-land*, from fields in the parish of Bosbury, called the *Barlands*, which were anciently held under the tenure of conveying the provision of the lord, or *Barelands*, from their deficiency of produce at some particular period; the *sack pear*, from its richness; and the *red pear*, from its colour.

Of the more common sorts, the *long-land* is the most valuable, and, for the general use of the farmer, perhaps the best of any. See *APPLE*, *APPLE-tree*, and *CIDER*.

In regard to the cider fruits, it has been remarked, that as the decay of the old and most valuable fruits in Herefordshire is so generally acknowledged and lamented, their renovation, or the introduction of others equally good, cannot be too strongly urged; and that the public spirit of the present age has not been indifferent on the occasion, as more endeavours have perhaps been directed towards this object within the last twenty years, than during a century preceding. Grafting, as most expeditious, has been most frequently attempted; but it is presumed that no mode of grafting hitherto practised has been found adequate to the purpose. The shoots, being unavoidably taken from old trees, flourish during a few years from the vigour of the crab stock, and relapse into all the infirmities of the parent tree. On this principle, the renovation of the old fruits appears impracticable. By the general laws of nature, each animated being lives to propagate its species, and after a time resigns its place to a successor. Mr. Knight observes, that the branch, from which a graft is taken, evidently partakes of the life of the tree to which it belongs; and that it is equally evident, that when part of a tree is detached, no new life is communicated, whether it be used as a graft, or placed to emit roots as a cutting: thus a tree, raised from a cutting, soon produces fruit in every respect similar to that of the tree from which it was taken. He

also remarks, that the habits of seedling trees are very essentially different, that their leaves are small and thin, and that the general habit changes gradually, assuming annually a more cultivated character: thus, if a graft be taken from a seedling tree of one or two years old, it will retain the character, and undergo the same annual change as the seedling tree, whatever be the age of the stock into which it is inserted; and that it will remain unproductive of fruit or blossom, until the seedling tree has acquired its proper age and maturity.

Hence he infers, as before mentioned, that the cutting must partake of the life, and consequently of all the habits of the original tree. In support of this theory, he states that a seedling walnut, grafted with a part of the bearing branch of an old tree, produced blossom at three years old; that the Spanish chefnut, under a similar process, blossomed in the year after it was grafted; and that an annual scion of a mulberry-tree, thus grafted, bore a plentiful crop of fruit (considering its size) in the third year after, and has continued to bear every year since. The grafts in these cases, Mr. Knight remarks, must have carried the nature and habits of the parent tree with them; and if they retain the habits, it may fairly be inferred that they retain also the same progressive tendency to decay. In short, a tree, like an animal, has "its infancy, its flowering spring, its summer's ardent strength, its sober autumn fading into age, and its pale concluding winter."

The opinion of the best informed planters is, that the seeds of the old fruits should be sown, and the most strong and healthy plants selected for cultivation, and a supply of grafts. This experiment has been adopted on a large scale by several planters, has hitherto promised the fullest success, and has, further, the sanction of that period in which orcharding received particular attention. And it is added, that a treatise on this subject was published by W. Lawson, a north countryman, in the year 1626; and he states, that the very best way to plant an orchard is to turn the ground with a spade in February, and to set, from February to May, some kernels of the best and soundest apples and pears a finger deep, and a foot distance; and to leave the likeliest plants only in the natural place, removing the others as time and occasion shall require. And that lord Scudamore also fully understood the nature and value of this practice; who, on retiring to Horn Lacy, amidst other useful and honourable employments of a country life, paid great attention to the culture of fruit-trees, and particularly to that of the red streak, which he seems to have introduced into general notice and esteem. As late also as the year 1654, a treatise, called "The Countryman's Recreation, or the Art of Planting, Grafting, &c." remarks, that "although the pippins be sown of the pomes of pears and good apples, yet we shall find that some of them do love the tree whereof they came, and those be right which have a smooth bark, and are as fair as those which be grafted." These instances, it is presumed, are sufficient to shew that, at the period alluded to, it was well known, that good fruits might be raised by sowing the kernels of good apples, and selecting those plants, which, in the absence of thorns, and in the general appearance of their leaves and bark, bore the greatest resemblance to the cultivated variety of the parent tree; whilst those which approach the native crab were carefully rejected.

Yet Evelyn, in the Appendix to his *Sylva*, published several years afterwards, proves that the practice was hardly known there in his time. He writes, nothing is more facile than to raise new kinds of apples *in infinitum* from kernels; yet in that apple county (Hereford), so much addicted to orchards, we could never encounter more than two or three

persons that did believe it. This method, however, is now becoming more and more general. The writer says, several thousand grafts, thus raised, are yearly distributed by the Agricultural Society, and are sought for with the utmost avidity. The most experienced planters consider it as the best, if not the only, expedient to preserve their provincial celebrity; and nothing surely can be more unphilosophical than to suppose that a piece of old dying tree can ever form a healthy and vigorous one.

It is added, that Mr. Knight has now many seedling apple-trees, produced between the Siberian crab and our richest apples. The vigour of most of them is astonishing. And as they blossom as early as the pear-trees, he is convinced that they will be found of great value, particularly in high situations, where the Siberian very rarely fails to produce a good crop of fruit.

In respect to the management afterwards, it chiefly consists in keeping the trees properly pruned, thinned, and cut in as above. In Herefordshire, large branches are rarely or never amputated. The instrument generally used for the purpose of pruning is a strong flat chissel, fixed to a handle six feet or more in length, having a sharp edge on one of its sides, and a hook upon the other.

It has been stated by the author of the *Treatise on Fruit-trees*, that when young trees are planted out from the nursery, as soon as they begin to break in the spring, they are to be cut down to three or four eyes, according to their strength, to furnish them with bearing wood. If this were not done, they would run up in long naked branches, and would not produce one quarter of the fruit which they do when this operation is properly performed. The same holds good in healing all kinds of old trees.

An opinion prevails, particularly in those parts where apple-trees are cultivated to any considerable extent, that trees never will bear after being headed down, and that it kills them. This may no doubt happen when they are improperly headed down all at once, by giving a sudden check to the sap, the few weak shoots not having strength to draw up what is supplied by the roots; and, moreover, not being capable of sheltering one another, they are chilled by the cold, and so rendered at least unproductive, if they are not totally killed. But if heading were done gradually, that is, if every other branch all over the tree were headed at a proper length, cutting as near to those parts where the shoots appear as possible, in the months of February or March, or even as late as May, in the course of the summer they would throw out fine long shoots. These should not be shortened the first year, unless it be necessary to shorten a few, to fill up the head of the tree with bearing wood; and that should be done in the following spring, cutting them to six or eight inches long, according to their strength. In the next spring, after the first branches are headed, the remaining old branches may be cut out, and these will soon fill the head of the tree with fine bearing wood. In three years, if properly managed, trees so headed will produce a much greater quantity of fruit, and of a better quality, than they did before the operation was performed. It has been remarked, that the management of orchards is capable of being reduced to a system under a few general heads, concentrated in the principle of making all trees in orchards healthy, round, large, and beautiful.

Due pruning would greatly prevent the speckled and stunted fruit, occasioned by the trees being overloaded with wood, which obstructs the rays of the sun, and causes a vapour, the cold whereof stunts the fruit in its first growth. When branches of any great size are to be cut off, Mr. Bucknall found it impossible to take them off by a bill,

without leaving a stump, or improper wound: and as it is essential that every branch be cut perfectly close and smooth, he used saws, and afterwards smoothed over the saw-cut with a knife, immediately applying his medicated tar to the wound. The medicated tar is composed of half an ounce of corrosive sublimate, reduced to a fine powder, and put into a three-pint pipkin, with a glassful of spirits of hartshorn, and stirred well together till the sublimate is dissolved. The pipkin is then filled by degrees with common tar, and constantly stirred till the mixture is blended as intimately as possible. This composition has been found by Mr. Bucknall to answer the purposes of excluding the air, keeping off insects and vermin of every description, and of assisting the wound to heal. But the composition directed by Mr. Forsyth is probably much better.

In heading down old decayed apple-trees, for the sake of symmetry, the author of the Treatise on Fruit-trees says, it will be necessary to cut at the forked branches, as near as can be to the upper side of the fork, cutting them in a sloping manner, to carry off the wet, at the same time rounding the edges. The orchardist may begin at the lower branches, cutting just above the lower bark, and proceeding upwards, cut the rest of the branches to six joints or forks, according to their strength, till he have finished cutting in the whole head. If any of these branches should have the canker, all the infected part must be cut out. When the tree is all prepared, the composition must be immediately applied, beginning at the top of the tree, and finishing with the powder of wood-ashes and burnt bones in descending, which will save its being rubbed off during the operation, and the composition will prevent the sun and air from injuring the naked inner bark. A tree thus prepared will, in the course of three or four years, produce more and finer fruit than a maiden tree that has been planted upwards of twenty years.

Mr. Marshall remarks, in his "Rural Economy of Gloucestershire and Herefordshire," that spring frosts are an enemy, against which, perhaps, it is most difficult to guard orchard trees. Dry frosts are observed to have no other effects than keeping the blossoms back; consequently, are frequently serviceable to fruit-trees. But wet frosts, namely, frosts after rain or a foggy air, and before the trees have had time to dry, are very injurious even to the buds. An instance is mentioned, in which a flying hazy shower in the evening was succeeded by a smart frost: that side of the trees against which the haze drove was entirely cut off; while the opposite side, which had escaped the moisture, likewise escaped the effect of the frost.

Much, however, may depend on the strength of the blossoms. The spring of the year (1788) had its frosts, and all hope of fruit was more than once given up; yet for quantity and quality, taken jointly, there has seldom perhaps been so favourable a fruit year. But this year, the buds formed, and the blossoms broke forth with unusual vigour; and were enabled, by their own strength, to set common enemies at defiance. On the contrary, the preceding spring, many of the blossoms sickened in the bud, and those which opened were weak and languid; the consequence was, in the instances he observed, scarcely an apple succeeded.

The assistance, therefore, required from art in this case, is, by keeping the trees in a healthful vigorous state, to enable them to throw out a strength of bud and blossom; and by keeping them thin of wood, to give them an opportunity of drying quickly before the frost sets in. See **BLIGHT**.

The author of the Report for the county of Hereford

says, that the pear, although, in general, producing an inferior liquor, possesses many advantages for general culture, when compared with the apple. It will flourish in a greater variety of soils, is more productive, and being incapable (in those sorts which are proper for perry) to be eaten or applied to any common culinary purpose, it is little subject to be stolen, even in situations where fruit does not abound. As an ornamental tree, it possesses sufficient merit to entitle it to a place where ornament is the principal object; its form is often picturesque, and it blossoms in the spring, and its fruit in autumn is always beautiful. Every tree, when nearly full grown, will afford, in moderately good ground, an annual produce of twenty gallons of liquor, (taking many years together,) even at the lowest calculation. Many single trees in Herefordshire have produced a hoghead in one season, and an extraordinary tree growing on the glebe land of the parish of Hom Lacy has more than once filled fifteen hogheads in the same year; when the branches of this tree, in its original state, became long and heavy, their extreme ends successively fell to the ground, and taking fresh root at the several points where they touched it, each branch became a new tree, and in its turn produced others in the same way. Nearly half an acre of land remains thus covered at the present time. Some of the branches have fallen over the hedge into an adjacent meadow, and little difficulty would be found in extending its progress. An acre of land is capable of containing thirty pear-trees of usual dimensions, which, taken from new varieties of fruit, would probably continue in a productive state beyond the conclusion of a second century. The produce of an acre planted with apple-trees, will generally be found nearly one-third less than the same quantity of ground planted with pear-trees would afford, with the exception of the halmer pear, and the old-field; but the apple-tree begins to bear at an earlier age, and cider will ever be justly preferred to the juice of the pear. As an object of sight, the pear-tree has every advantage over its rival; but Mr. A. Knight is of opinion that under the system now practising, to procure new varieties, the apple-tree may, in some degree at least, acquire the recommendation of ornament, as well as use; those crossed with the Siberian crab promise to be of this description. The value of the ground as a pasture in closely planted orchards will necessarily be much reduced, but the loss of herbage will in a few instances amount to more than one-tenth of the value of the fruit.

The grafts produced in an orchard comes very early in the spring, when it is peculiarly valuable to the farmer. Under judicious management it is never suffered to grow long or coarse, and an orchard in this condition will be found to support a very considerable quantity of stock.

It is further observed in the same report, that if the apple and pear-trees were thinly dispersed over the meadows and pastures of every district in which they would succeed, the injury done to the herbage would be extremely small; and the trees might perhaps be made to supply the whole population of the country employed in agriculture, with as wholesome and palatable a beverage as they now possess, and in fruitful years a large quantity would be afforded for the use of the towns. The number of acres now employed in raising hops and poles to support them, might be greatly reduced, and this alone would prove an immense advantage to agriculture. Hops at present occupy the best ground the farmer has to give them, they take his best manure, they are too often the principal objects of his attention, and whilst their culture injures the crops of corn in every district where they abound, it may be questioned whether the produce of a thousand acres annually afford nutriment sufficient to support a human

a human being. By an extended culture of the apple and pear, many millions of bushels of barley, now converted into malt, might be annually saved and applied to better purposes.

The ground now employed in its culture might be made to produce wheat, or other articles immediately necessary to society; and that the juice of the apple and pear will afford a liquor as wholesome as any which can be obtained from malt, is sufficiently evinced by the general appearance of the natives of this and other cider counties.

In the district of Kent, according to Mr. Marshall, in some instances the interspaces of young orchards are occupied by hops, in others by filberts, and in grown orchards the latter are sometimes seen. Some old orchards are likewise in permanent sward, others under arable or garden crops, and some in sainfoin, while others are in lucern. See PLANTING, FRUIT-Trees, and APPLE-Tree.

It has been observed by the author of the Rural Economy of Gloucestershire and Herefordshire, that the cultivation of fruit-trees, for the sole purpose of liquor, is peculiar to the western provinces. The southern counties, when the London markets are overstocked with fruit, make a sort of liquor from the surplus; but the eastern, the northern, and the midland counties, may be said to be as much unacquainted with the business of a liquor-orchard, as they are with that of a vineyard. Even Staffordshire, which is divided from the cider country by a narrow ridge of hill only, has not, generally speaking, a barrel of cider made within it.

Herefordshire has ever borne the name of the first cider county; Gloucestershire, however, claims a preference in the two most celebrated fruit-liquors the district affords. Worcestershire and Monmouthshire have their claims of excellency. May Hill may be considered as the centre of this division of the cider country.

Devonshire, and its environing counties, form another division; which, though upon the whole much inferior to this, produces one species of liquor (the coccagee cider,) which is in high estimation. See CIDER.

Persons robbing orchards are to make such recompence of damage as a justice shall award, and forfeit not exceeding 10s. or be sent to the house of correction, &c. Stat. 43 Eliz. cap. 7. See LARCENY.

ORCHARD, *Cherry*, in *Agriculture*, that sort of orchard which is principally destined to the raising of cherries. These sorts of orchards are common in the county of Kent, in which the common black cherry is mostly cultivated, though, according to Mr. Marshall, it is now on the decline. In Hertfordshire, about King's Langley and Watford, they employ the caroon and small black, as the Kentish will not thrive there at all. In Kent they are planted in lines at the distance of twenty feet asunder, but in Hertfordshire they allow each tree nine square perches of land. In about two years after planting, cherry-trees begin to bear, and a full-grown tree will produce fifty dozen pounds in a good year, and from ten to twenty years six dozen. The prices vary from ten-pence to three shillings the dozen. They are very beneficial to the poor in the quantity of employment which they afford in gathering the crop, in which they are paid from 4d. to 8d. per dozen pounds.

ORCHARD *Fruit*, that sort of fruit which is grown in orchards. In some districts, and particularly that of Kent, besides apples and pears, they have other sorts of orchard-fruits, such as plums, cherries, filberts, &c.

ORCHARD *Grafts*, a small, fine, very sweet grafts, rising under the trees in orchards. This sort of grafts is of a very purgative quality. It should be kept eaten down well, in order to render it the most productive.

ORCHESIS, in the *Ancient Pantomime*, was a term given by the Greeks to what the Romans termed *Saltatio*. It consisted in imitating all the gestures, and all the movements practised by mankind. Varro tells us that the word *Saltatio* comes from *Salus*, who first taught the art to the Romans. We must not, as is generally done, confound the dance with the leap; but remember that the true dance of the ancients was an imitation of the actions, attitudes of the body, gestures, in short, of all the demonstrations with which men commonly accompany their speech, or which they sometimes use to explain their sentiments without the assistance of words.

The art was divided into many species, and had produced among the ancients such a number of different dances, that Meursius composed an entire dictionary with their names. According to Athenæus, Thelostes was the inventor of this kind of dance, which we call the *acting art*.

This was, of all the musical arts, that of which the ancients were most passionately fond, and which was of the greatest utility in every state of life, from the strolling player to the orator.

Apuleius has left us a description of a representation of the Judgment of Paris, executed in pantomime. He only uses the word *to march*, and says, that Venus *declaimed with her eyes*. So that the ancients seldom boasted of feats of activity with the legs and feet of their dancers; but often with their arms and hands. The muse Polhymnia was the patroness of Mimes, with her finger on her mouth in token of silence. Some etymologists, among whom are Plutarch and Nonnus, derive her name from *Μῦμος*, *tradition*, alluding to the tales and fables of antiquity. Nonnus, Dionys. v. v. 104, et seq. says,

" Sweet Polhymnia see advance,
Mother of the graceful dance.
She who taught the ingenious art
Silent language to impart:
Signs for sentiment she found,
Eloquence without a sound:
Hands loquacious save her lungs,
All her limbs are speaking tongues."

See MIME and PANTOMIME.

ORCHESOGRAPHY, the art of noting all the steps and motions used in dancing. See DANCE.

ORCHESTRA, in the *Drama*, the lower part of the ancient theatre; made in form of a semicircle, and surrounded by the seats.

It was so called, because, in the Grecian theatres, it was a place where they held their balls; from *ορχομαι*, *I dance*.

The orchestra, among the Greeks, made a part of the scena; but, on the Roman theatres, none of the actors went down to the orchestra, which was taken up with seats for the senators, magistrates, vestals, and other persons of distinction; answering, nearly, to the pit in our theatre.

The orchestra of the ancient Greeks had its name from being that part of the theatre where the *dances* were performed. At present the word is more particularly applied to the station where a band of music is placed in a theatre, or great concert room. The leader of a band, or orchestra, should not only be a great and experienced performer, but of a firm and determined character, that commands respect for his orders; given without insolence or tyranny, but in a manner not to be disputed or disregarded. All the perfections or defects of an orchestra are ascribed by the public to want of discipline or weight in the leader. The numerous imitative

imitative and picturesque effects dependant on the orchestra of an opera, excite as much attention in the audience, as the poetry and singing. The orchestra is a composer's palette, and each solo instrument a colour and a pencil. The tone of these, whether alone, or in the aggregate, should have their peculiar and general effect, occasionally, and contribute to the colouring of the piece.

The material of which an orchestra is constructed, is not a matter of indifference; it should be formed of soft and sonorous wood, such as picked deal or fir; the spectators should not be allowed a place so near as to lean upon it, and check its vibration. It should be regarded as a grand instrument, which accords with all the others, and augments their effects. The arrangement of an opera band should be in such a manner, as that the several instruments may not be too near or too remote from each other. The number of each species of instruments should be proportioned to the effect which they ought to produce when employed together. The bases, for example, should not suffocate the trebles, nor the trebles be overpowered by them. The hautbois should not domineer over the violins, nor the seconds over the first. The wind-instruments and drums, above all, should be kept under, and not fancy that music and noise are synonymous terms. With regard to the distribution of the interior, care must be taken, first, that the violins are ranged in two lines, facing each other, one fronting the stage, and the other facing the audience; 2dly, that the bases should be disposed round the two harpsichords, and in every part of the orchestra; as the base, which regulates and sustains the harmony of the several parts, should be equally heard by all; 3dly, that all the performers should have an eye on the master at the first harpsichord, and the master be enabled to see them; in the same manner each violin should be in sight of the leader, and each reciprocally see and be seen by each other.

In 1754, the first orchestra in Europe for number and intelligence, was that of Naples; but that which was the best distributed, and formed the most complete whole, was the orchestra of the king of Poland, at Dresden, under the direction of the illustrious Hasse; a plate of which is inserted G fig. 1. in Rousseau's Hist. de Mus. The representation of this orchestra shews how, by a single glance of the eye, an idea may be formed of the distribution of the performers, better than by a long verbal description. We asked signor Hasse at Vienna if this representation of the Dresden orchestra was accurate, and he said it was so correct, that he should have imagined that M. Rousseau had been an able painter, and made the drawing himself.

Rousseau finishes the article orchestra by a contrasted description of that at Paris of the same period, which we suppose has been reformed with the state. It will, however, be historical, and enable our readers to form some idea of what kind that music was, and how performed, with which the natives of France were so pleased and exclusively vain.

"It has been observed," says the citizen of Geneva, "that of all the orchestras in Europe, that of the opera at Paris, though one of the most numerous, produced the least effect. The reasons are very obvious; first, the bad construction of the orchestra, buried in the earth, and surrounded with rails of heavy and massy wood, cramped with iron, which impedes all resonance. 2. The bad choice of the performers, for the most part forced on the manager by recommendation, with scarce any knowledge of music, or the least intelligence or attention to the effect of the ensemble. 3. Their tuning and invariable noise, tuning, and flourishing continually with all their force, without ever being in tune. 4. The French propensity, which is in general to neglect and dis-

dain all that becomes a daily labour. 5. The bad instruments of the performers, which remaining on the spot are always out of order and unfit for use, destined to roar during one half of the year, and to rot the other. 6. The bad situation of the master, who is in front of the theatre, and occupied by the vocal performers, is not able to attend sufficiently to the orchestra, which is behind him instead of being in full view. 7. The insupportable noise the truncheon of him who beats the time makes, which covers and destroys all the effects of the symphonists. 8. The bad harmony of the compositions, which being never pure and select, lets nothing be heard but noise and confusion. 9. The scarcity of double bases and violoncellos, of which the drawling sounds suffocate the melody and deafens the audience. 10. And finally, the total want of measure, and indeterminate character of the French music, where it is the finger who directs the orchestra, instead of the orchestra regulating the finger, and where the treble leads the base, instead of the base leading the treble."

Sixteen years after this period, the orchestra at Brussels was the most celebrated in Europe, though its performers were the ministers of French music. It was under the direction of M. Fitzthumb, a very active and intelligent maestro di capella, who beat the time (which then could not be dispensed with), and was indefatigable in preserving good discipline. The orchestra was so admirably conducted, and the band, taken as a whole, so numerous, powerful, correct, and attentive, that if the horns had not been bad and out of tune, the effect of the whole would have approached perfection so near as to have tongue-tied criticism itself.

ORCHIDEÆ, in *Botany*, a most natural and very curious order of plants, which has attracted general notice by its beauty and singularity, derives its name from one of the principal genera of which it is composed, and makes the seventh among the natural orders of Linnæus, the third of the fourth class in Jussieu. For the characters of this fourth class, see **MUSÆ**.

Great advances have been made in the knowledge of these plants since the publications of Linnæus and Jussieu, whose remarks we shall therefore pass over. Swartz, pursuing a path which Haller had in some measure pointed out, undertook a new arrangement of the *Orchideæ*, chiefly depending on the structure of their anthers. He has published his system in the Upsal and Stockholm Transactions, and lastly, in a more perfect form, in the first volume of Schrader's New Journal. Willdenow in his Sp. Pl. v. 4, follows the steps of Swartz. We have had frequent occasion to refer to these writers, under genera belonging to the order in question; see **CYMBIDIUM**, **DENDROBIUM**, **DISA**, **EPIDENDRUM**, **EPIPAETIS**, &c. Mr. Brown, in his Prodr. Fl. Nov. Holl. v. 1. 309, has revised the labours of his predecessors, corrected several mistakes, and thrown much new light on the subject, for which the novel productions of New Holland have in this, as in other cases, afforded him ample opportunity. We shall give a sketch of the characters of the *Orchideæ*, founded chiefly upon his principles, except that we presume to consider as a calyx the three outer leaves or segments only of the flower, and the two innermost, with the lip, or nectary, as corolla. Swartz takes the five leaves for a calyx, the lip only for the corolla.

Cal. Perianth superior, permanent, of three leaves, either distinct, or more or less united at their base; the dorsal or uppermost often broadest and most concave, rarely elongated below into a pouch or spur; all frequently coloured. **Cor.** Petals two, equal, between the dorsal and lateral leaves of the calyx, and of a smaller size; their base sometimes elongated into a pouch with that of the lateral calyx-leaves.

Nectary

Nectary a lip, dependent or prominent in front, between the two petals, and inserted in the same row or circle with them, various in shape and colour, undivided or lobed, entire or many-cleft, convex or concave, sometimes bearing honey on its upper surface, often continued at the base into a bag or spur behind the flower, which spur contains the honey, and is in some few instances double. *Stam.* Filaments, according to Mr. Brown, really three, though united more or less completely together by means of the style, or column (as it is technically called) and directed towards the dorsal leaf of the calyx, in opposition to the lip; the two lateral or lowermost of these filaments are, for the most part, abortive, and generally obsolete, being perfect, or bearing anthers, in *Cypripedium* only; the third only in general bearing an anther, and being abortive when the lateral ones are perfect; anther of two cells, its lobes either distant, in which case they are united with the sides of the column, whose summit is frequently elongated beyond them, or they are approximated so as to compose an anther either parallel to the stigma and fixed, or terminating the column in the form of a moveable lid; each cell is very commonly divided internally by a longitudinal partition, which in some few instances is threefold; the pollen coheres in elastic masses, one of them in each cell, and each frequently attaching itself, by an elongated viscid base, to the stigma, or indeed to any thing on which it happens to fall from the anther. *Pist.* Germen roundish, obovate, or elliptical, ribbed, with three principal angles opposite to the three calyx-leaves, of one cell, with three linear parallel receptacles attached to its valves opposite to the petals and lip; style columnar, bearing the anther or anthers, somewhat oblique, sometimes very short; stigma a glandular moist and lucid space, generally in front looking towards the lip, convex or concave, which are either naked, or contained in a pouch or sack, that is sometimes common to both, sometimes double and distinctly appropriated to each; see *OPHRYS*: to these glands the masses of pollen naturally attach themselves when the anther opens. *Peric.* Capsule ovate or inclining to cylindrical, of three valves, often bursting by clefts between the three principal ribs, and cohering at the base and summit. *Seeds* very numerous and minute, each generally enclosed in a membranous tunic, pointed at both ends; but in *Vanilla* they are naked.

The habit of these plants is generally herbaceous, sometimes rather shrubby. *Root* tuberous, often globose, or fibrous, thick and fleshy, perennial. *Stem* simple, rarely branched, either leafy or sheathed. *Leaves* simple, entire, sheathing at the base, alternate, in the branched species, (which are often parasitical,) peculiarly coriaceous and rigid. *Flowers* either spiked, racemose, corymbose, or solitary, rarely paniced; each attended by a *bractea*. *Pubescence*, if present, which is not often the case, simple and acute, sometimes composed of capitate glands. The propagation of these plants by the root is, in fact, like that of the potatoe and other tuberous plants properly so called. Each knob, of the globose and palmate-rooted kinds, flowers but once, and that either the season immediately subsequent to its formation, or several years afterwards; it then withers and decays. Meanwhile a knob for the following year is perfected, just as the former is flowering. The same process appears to take place in some *Orchideæ* with bundles of thick fibres, and perhaps even in the parasitical creeping kinds.

The genera in Linnæus are eight, *Orchis*, *Satyrion*, *Ophrys*, *Serapias*, *Limodorum*, *Arelhusia*, *Cypripedium* and *Epipendrum*; to which Jussieu adds *Thelymitra* of Forster, *Difa* of Bergius, *Bipinnula* of Commerçon, *Vanilla* of Plu-

mier, and a new genus of his own called *Pogonia*. Swartz does not adopt *Bipinnula* nor *Pogonia*, but he has established several new and, for the most part, very good genera, *Pterigodium*, *Disperis*, *Corycium*, *Neottia*, *Cranchis*, *Epipactis*, *Malaxis*, *Cymbidium*, *Oncidium*, *Aërides*, *Dendrobium*, *Stelis* and *Lepanthes*. Willdenow adopts these, along with *Diuris* of Smith, to which he has added two genera of his own, *Bonatea* and *Habenaria*. Swartz has taken up, from the Flora Peruviana, *Anguloa*, *Gongora* and *Majdevallia*, which Willdenow omits. Brown has the following new genera from New Holland, *Epiblema*, *Orthoceras*, *Cryptostylis*, *Prasophyllum*, *Genoplesium*, *Calochilus*, *Microtis*, *Acianthus*, *Cryptostylis*, *Chiloglottis*, *Eriochilus*, *Caladenia*, *Lyperanthus*, *Glossodia*, *Pterostylis*, *Corysanthes*, *Calceana*, *Gastrodia*, *Dipodium* and *Sarcochilus*. The last-mentioned author also considers *Epipogium* as a distinct genus; see that article, and many of the rest, in their proper places.

ORCHIDION was a name given by Mitchel to an orchideous genus from Virginia, which Linnæus called *Arelhusia*.

ORCHIDOCARPUM, a genus established by Michaux upon the *Annona triloba* of Linnæus, with *pygmaea* and *grandiflora* of Bartram, to which is added a fourth species by the name of *O. parviflorum*. The flower is said to be that of an *Unona* or *Uvaria*, but the fruit consists of several berries, by abortion sometimes nearly solitary, sessile, rather large, egg or rather kidney-shaped. *Seeds* several, tunicated, ranged in a simple series along the internal suture. The name applies to the testicular form of the fruit. Mich. Boreali-Amer. v. 1. 329.

ORCHIES, in *Geography*, a town of France, in the department of the North, and chief place of a canton, in the district of Douay; 12 miles S.S.E. of Lille. The place contains 2778, and the canton 13,100 inhabitants, on a territory of 105 kilometres, in eight communes.

ORCHIL. See ARCHIL.

ORCHILLA, or HORTICILLA, in *Geography*, a small island in the West Indies, near the coast of South America; or rather a cluster of islands, the largest of which is in the form of a crescent or half moon. These isles are separated from one another by very shallow canals. On the E. and W. capes are some hills, which supply the goats with pasture. On the S.W. side of the main island the water is deep, and the shore is perpendicular, like a wall. The N.W. has scarcely any trees or grafs; but on the E. and W. both abound. The soil, from the low land, is salt, and produces few plants. The island has little fresh water, and the only animals upon it are goats and lizards. N. lat. 12°. W. long. 65° 20'.

ORCHIS, in *Botany*, an ancient name, alluding to the testicular shape so frequent and so remarkable in the roots of many species. This resemblance alone seems to have led to the use of these roots, in various ages and countries, as an aphrodisiac or restorative. Linn. Gen. 461. Schreb. 502. Willd. Sp. Pl. v. 4. 8. Mart. Mill. Dict. v. 3. Sm. Fl. Brit. 918. Juss. 65. Lamarck Illustr. t. 726. Swartz Act. Holm. for 1800. 205. t. 3. f. A. Schrad. New Journ. v. 1. 6. t. 1. f. A. Brown Prodr. Nov. Holl. v. 1. 312, under *Habenaria*. Class and order, *Gynandria Monandria*. Nat. Ord. *Orchideæ*.

Gen. Ch. *Cal.* Perianth superior, of three spreading leaves; the uppermost vaulted. *Cor.* Petals two, often approximated or attached to the upper leaf of the calyx. Nectary a spreading lip, with a tubular spur behind. *Stam.* Anther large, oblong, erect, attached in a parallel manner to the summit of the style, of two cells, opening in front; the masses of pollen club-shaped, attaching themselves, each

by

by its taper base, to one or two glands by the stigma, in one and the same pouch; style columnar, short; stigma below the anther, convex, oblique. *Peric.* Capsule oblong, with three ribs, of one cell and three valves, splitting by three lateral fissures. *Seeds* numerous, minute, each with a chaffy tunic.

Eff. Ch. Upper leaf of the calyx vaulted. Lip of the nectary with a posterior spur. Anther terminal, parallel. Masses of pollen stalked, their bases approximated within a simple pouch.

The vast genus of *Orchis*, as it stands in Swartz and Willdenow, is now much curtailed by Mr. Brown, who excludes from it all the species that have not a simple pouch containing the bases of both the masses of pollen together. These are separate, each with its own pouch, in *Ophrys*, (which besides has no spur to the flower,) and separate, without any pouch, which, so understood, becomes a large and very natural genus. The true *Orchis*, thus defined, is scarcely found out of Europe, one species only being known in America, none in the southern hemisphere, nor between the tropics. What Mr. Brown has found answering to this character are *O. morio*, Engl. Bot. t. 2059; *mascula*, t. 631; *pulchris*, Jacq. Ic. Rar. t. 181. Willd. n. 41; *uticulata*, Engl. Bot. t. 18; *militaris*, t. 1873; *fusca*, Jacq. Austr. t. 307, which was first published as *militaris* in Engl. Bot. t. 16; *papilionacea*, Linn. Sp. Pl. 1331, of which *rubra*, Jacq. Ic. Rar. t. 183, seems to us a variety; *pallens*, Jacq. Austr. t. 45; *coriophora*, Linn. Sp. Pl. 1332. Jacq. Austr. t. 122; *odoratissima*, Linn. Sp. Pl. 1335. Jacq. Austr. t. 264; *specabilis*, Linn. Sp. Pl. 1337, found in North America; *sambucina*, Linn. Sp. Pl. 1334. Jacq. Austr. t. 108; *pyramidalis*, Engl. Bot. t. 110; *hircina* (*Satyrium*) t. 34; *globosa*, Linn. Sp. Pl. 1332. Jacq. Austr. t. 265; *latifolia*, Engl. Bot. t. 2308; and *maculata*, t. 632. We have here referred to Engl. Bot. only for such species as are British. Mr. Brown suggests that there are Orchideous plants of European growth, especially with purple flowers, that unquestionably belong to the present genus. Of the British ones besides referred to it by Swartz, *Orchis bifolia*, Engl. Bot. t. 22; *Satyrium viride*, t. 94; and *albidum*, t. 505; are considered by Mr. Brown as *Habenaria*.—*Orchis conopsea*, Engl. Bot. t. 10, though it has all the habit and general characters of a true *Orchis* as defined above, has no pouch at all for the masses of pollen, which are inserted, as in *Habenaria*, into two naked glands, but they are approximated as in *Orchis*. Hence Mr. Brown, in the new edition of Ait. Hort. Kew. published under his care, has established this plant as a new genus, called *Gymnadenia*, in allusion to these naked glands.—The species of *Orchis* are found, some of them copiously in meadows or moist groves, others more partially and sparingly on dry chalky hills. They flower in June or July, and are mostly beautiful, some of the kinds very richly scented.

ORCHIS, in *Gardening*, contains plants of the herbaceous, bulbous-rooted, flowery perennial kind, of which the species cultivated are; the butterfly orchis (*O. bifolia*); the female or meadow orchis (*O. morio*); the male or early spotted orchis (*O. mascula*); the man orchis (*O. militaris*); the broad-leaved or marsh orchis (*O. latifolia*); the spotted orchis (*O. maculata*); the long-spurred orchis (*O. conopsea*); and the purple bird's-nest, or bird's-nest orchis, (*O. abortiva*).

The second sort has varieties with purple flowers, with red flowers, with violet flowers, with flesh-coloured flowers, and with white flowers.

The fourth species has also several varieties.

In the fifth there are different varieties.

And the sixth varies with purple flowers, red flowers, and white flowers.

Method of Culture.—These curious plants may all be introduced and preserved in the pleasure-grounds, by proper care in removing them from their native situations, which should always be done when their leaves decline, being previously marked. When removed at other seasons, they seldom succeed. They should be taken up with balls of earth about their roots, and be immediately replanted, in a soil and situation as nearly as possible the same as that from which they were taken. When thus managed, they continue many years flowering in a strong manner.

They afford much variety where the different kinds are in the borders, and other parts, in a proper manner.

ORCHIS-Root, in the *Materia Medica*, is otherwise named *salep*, vulgarly called *saleop*. See *SALEP*.

ORCHAMENO, in *Geography*, a town of European Turkey, in the Morea, anciently "Orchamenus;" 25 miles W. of Argo.

ORCHOMENE, in *Ancient Geography*, a name by which several towns are distinguished. Homer, in speaking of that of Bæotia, gives it the epithet of Μινύειον, or Minyan; thus discriminating between this and another town of the same name in Arcadia. According to Pausanias, Orchomene had been one of the most considerable towns of Greece. The Orchomenians appear by Homer's account to have been very powerful at the time of the Trojan war. When the sons of Cadmus emigrated into Ionia, in order to establish colonies, the Orchomenians took part in their expedition. Their power excited the jealousy of the Thebans, who drove them from their town; and though they were re-established by Philip, the father of Alexander, their condition was always feeble and declining. At Orchomene, among other objects of curiosity, were a temple of Bacchus, a temple consecrated to the Graces, and a building called the treasury of Minyas. Here were also the tomb of Minyas and that of Hesiod.—Also, a town of Arcadia, a little N.W. of Mantinea. This town contained, among other monuments, two temples, one of Neptune, and another of Venus, and these divinities were represented in marble.

ORCHOTOMIA, from ορχις, *testicle*, and τεμνω, *to cut*, in *Surgery*, the operation of removing the testicle: castration.

ORCI Nuovo, in *Geography*, a fortress of Italy, in the department of the Mela, on the Oglio, built by the Venetians for the defence of their territories from the Spaniards, who were at that time in possession of the Milanese; 15 miles S.W. of Brescia.

ORCI Vecchia, a town of Italy, in the department of the Mela; 14 miles S.W. of Brescia.

ORCIANO, a town of Italy, in the duchy of Urbino; 16 miles S.E. of Urbino.—Also, a town of Etruria; 7 miles E. of Leghorn.

ORCIATICO, a town of Etruria; 8 miles W. of Volterra.

ORCIERES, a town of France, in the department of the Higher Alps, and chief place of a canton, in the district of Embrun; 9 miles N.W. of it. The place contains 1145, and the canton 2352 inhabitants, on a territory of 362½ kilometres, in 3 communes.

ORCINO, a town of the department of Liamone, or the island of Corsica, and district of Ajaccio. The number of inhabitants in the canton is 2780.

ORCO, a river of Piedmont, which runs into the Po, near Chivazzo.

ORD of Caithness, a cape of Scotland, on the S.E. coast of the county of Caithness. N. lat. 58° 7'. W. long. 3° 28'.

ORDAVAR,

ORDAVAR, a town of Persian Armenia; 50 miles S.E. of Naefivan.

ORDEAL, **ORDALIUM**, a form of trial, that is, of discovering innocence or guilt; practised in England in the time of Edward the Confessor: and since, as low as king John and king Henry III.

The word, in the original Saxon, signifies a great judgment, formed of *or*, great, and *deal*, or *dele*, judgment.

It was called *purgatio vulgaris*, or *judicium Dei*, in opposition to *bellum* or *combat*, the other form of purgation: and also to the canonical purgation, which was by the oath of the party.

The ordeal was of various kinds; viz. that of fire, that of red-hot iron, that of cold water, that of judicial pottage, that of hallowed cheefe, that of boiling water, that of a cross, and that of dice laid on relics, covered with a woollen cloth. There were particular masses for each species of ordeal. See **CORSNED**, and *Judgment of the Cross*.

The more popular kinds of ordeal were those of red-hot iron and water: the first for freemen and people of fashion; the second for peasants.

Fire-ordeal was performed either by taking up in the hand, unhurt, a piece of red-hot iron, of one, two, or three pounds weight; or else by walking, barefoot and blindfold, over nine red-hot plough-shares, laid lengthwise, at unequal distances; and if the party escaped without injury, he was adjudged innocent; but if it happened otherwise, as without collusion it generally did, he was then condemned as guilty. The former was conducted in this manner: a ball of iron was prepared, of one, two, or three pounds weight, according to the nature of the accusation. When all the prayers and other religious ceremonies were finished, this ball was put into a fire, and made red-hot; after which it was taken out. The prisoner having signed himself with the cross, and sprinkled his hand with holy water, took the ball of hot iron in his hand, and carried it to the distance of nine feet; after which his hand was put into a bag, and sealed up for three days; at the expiration of which it was examined, in the presence of twelve persons of each party. If any marks of burning appeared upon it, the accused was found guilty; if none, he was declared innocent. Ducange Gloss. Voc. *Ferrum Candens*.

It is a popular story in our histories, that Emma, mother of Edward the Confessor, being accused of too much familiarity with Alwyn, bishop of Winchester, demanded the ordeal of red-hot iron; and passed barefooted and hood-winked over nine red-hot plough-shares, without touching any of them.

Water-ordeal was performed either by plunging the bare arm up to the elbow in boiling water, and escaping unhurt; or by casting the person suspected into a river or pond of cold water, and if he floated therein, without any action of swimming, it was deemed an evidence of his guilt, but if he sunk he was acquitted.

The preparations by fastings, prayers, and other religious exercises, were the same for both these ordeals. In the hot-water ordeal, the person to be tried was conducted with great solemnity to the church, where the priest began by saying certain prayers suitable to the occasion; after which mass was celebrated; and before the accused was permitted to communicate, he was adjured, in the most awful form of words, to confess if he was guilty. Fire was then kindled under a pot filled with water; and while the water was heating, the priest said many prayers composed for that purpose. As soon as the water began to boil, a stone was suspended in it by a string, at the depth of one, two, or three palms, according to the nature of the accusation.

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The pot was then taken down and placed by the side of the fire; and the prisoner having said the Lord's prayer (not very rapidly we may presume), and marked himself with the sign of the cross, plunged his naked hand and arm into the water, and snatched out the stone. His arm was instantly wrapped in linen cloths, and put into a bag, which was sealed by the judge in the presence of the spectators. The prisoner was then restored to the priest, who produced him in the same church at the end of three days; when the bag was opened, the bandages taken off, and the arm examined by twelve of his own friends, and twelve of the friends of the prosecutor. If any marks of scalding then appeared upon the arm, the prisoner was found guilty: if no such marks could be discovered, he was acquitted. Ducange Gloss. apud. Voc. *Aque ferventis judicium*.

The ordeal by cold water was thus conducted: the person who was tried was put under the direction of a ghostly father, of great reputation for his sanctity, who obliged him to perform many extraordinary acts of devotion, and to keep a rigorous fast for three days. When this fast was ended, and the day appointed for the trial came, the prisoner was publicly conducted to the church, where the priest celebrated mass; and before he permitted the accused to communicate, he addressed him in the following solemn strain: "I adjure thee, O man, by the Father, Son, and Holy Ghost, by the true Christianity which you profess, by the only begotten Son of God, by the holy Trinity, by the holy Gospel, and by all the holy relics in this church, that you do not presume to communicate, or approach this holy altar, if you have committed this crime, consented to it, or know who committed it." If the prisoner made no confession, the priest gave him the communion, saying, "Let this body and blood of our Lord Jesus Christ be received by you as a probation this day." After this a quantity of holy water was consecrated, and then the whole company left the church, and went in procession to the pool where the ordeal was to be performed. When they arrived there, the priest gave the prisoner a draught of the holy water, saying, "Let this holy water be to thee a probation this day." If the prisoner still continued to deny his guilt, the priest then pronounced a long and very fervent prayer over the pool, adjuring it by every thing that was divine and venerable in heaven or on earth, that if the person to be thrown into it was guilty, it would reject him, and cause him to float upon its surface; but if he was innocent, that it would receive him into its bosom. The prisoner was then stripped naked, his hands and legs made fast, and a rope tied about his middle, with a knot upon it, at the distance of a yard and half from his body, and thrown into the pool. If he floated, which was hardly to be expected, he was taken out, and declared guilty; if he sunk so deep as to carry the knot of the rope under water, he was instantly pulled out, before he could receive any injury. Muratori Antiq. t. 3. Wilkins's Leg. Saxon, p. 61.

This ordeal was evidently a very uncertain test of guilt or innocence; but the great solemnity with which it was administered, might sometimes strike terror into the minds of criminals, and bring them to confession. In this ordeal it is presumed that God would work a miracle for the detection of guilt: in the ordeals of hot water and hot iron, the presumption was, that he would work a miracle for the vindication of innocence: but for either of these presumptions there was no solid foundation.

It is easy to trace out the traditional relics of this water-ordeal, in the ignorant barbarity still practised in many countries, to discover witches, by casting them into a pool of water, and drowning them to prove their innocence. This

purgation by ordeal seems to have been very ancient, and very universal, in the time of superstitious barbarity. It was known to the ancient Greeks, vide Antigone of Sophocles, v. 270. And Grotius Com. on Numb. v. 17. gives many instances of water-ordeal, in Bithynia, Sardinia, and other places.

It was very anciently known in Persia, and perhaps originated from their superstitious veneration for fire. Records of trial by ordeal remain above 500 years before the Christian era. It is still in practice, where satisfactory evidence cannot be obtained, among the Gentoos, in Hindoostan, and of very high antiquity. It is mentioned several times in the code of Gentoo laws, as a common mode of proof. The modes of this ordeal are various in India, according to the choice of the party, or nature of the offence; but the infallibility of the result is to this day as implicitly believed, as it could have been in the darkest ages of antiquity. See chap. iii. of the Code of Gentoo Laws, by Halhed.

The most respectable authors, ancient and modern, attribute the invention of water-ordeal, in the Christian church, to pope Eugenius II.; though Le Brun, a priest of the Oratory, maintains, that it was more ancient. However this be, the custom was condemned and abrogated, by the authority of Lewis the Meek, about the year 829. It was afterwards revived, and practised in the 10th, 11th, and 12th centuries.

The first account we have of Christians appealing to the fire-ordeal, as a proof of their innocence, is that of Simplicius, bishop of Autun, who lived in the 4th century. This prelate, as the story is related, before his promotion to the episcopal order, had married a wife, who loved him tenderly, and who, unwilling to quit him after his advancement, continued to sleep in the same chamber with him. The sanctity of Simplicius suffered, at least in the voice of fame, by the constancy of his wife's affection: and it was rumoured about, that the holy man, though a bishop, persisted, in opposition to the ecclesiastical canons, to taste the sweets of matrimony; upon which, his wife, in the presence of a great concourse of people, took up a considerable quantity of burning coals, which she held in her clothes, and applied to her breasts, without the least hurt to her person or her garments, as the legend says, and her example being followed by her husband, with the like success, the silly multitude admired the miracle, and proclaimed the innocence of the loving pair. A similar trick was played by St. Brice, in the fifth century. Mosh. Eccl. Hist. vol. ii. 1768.

The practice of ordeal obtained very generally in more modern times; and even in England so late as king John's time, we find grants to the bishops and clergy to use the *judicium ferri, aque, et ignis*. And both in England and Sweden, the clergy presided at this trial, and it was only performed in the churches or in other consecrated ground. However, the canon law declared very early against trial by ordeal, as being the fabric of the devil. Upon this authority, though the canons themselves were of no validity in England, it was thought proper (as had been done in Denmark, above a century before,) to disuse and abolish this trial entirely in our courts of justice, by an act of parliament of 3 Hen. III. according to sir Edward Coke, or rather by an order of the king in council. Blackst. Com. vol. iv.

If we imagine that few or none escaped conviction, who exposed themselves to these ordeals, we shall be much mistaken: for the histories of those times in which they were in use contain innumerable examples of persons plunging their naked arms into boiling water, handling red-hot balls

of iron, and walking upon burning plough-shares, without receiving the least injury. (Ducange Gloss. t. iii. p. 399, &c.) Several learned men have been much puzzled to account for this, and have been disposed to think that Providence graciously interposed in a miraculous manner for the preservation of injured innocence. But upon examining every circumstance of these ordeals with due attention, we shall perceive reason sufficient to suspect that the whole was a gross imposition on the credulity of mankind. The accused person was committed wholly to the priest who was to perform the ceremony, three days before the trial, in which he had time enough to bargain with him for his deliverance, and give him instructions how to act his part. On the day of trial, no person was permitted to enter the church but the priest and the accused, till after the iron was heated; when twelve friends of the accuser and twelve friends of the accused, and no more, were admitted, and arranged along the wall on each side of the church, at a respectful distance. After the iron was taken out of the fire, several prayers were said, the accused drank a cup of holy water, and sprinkled his hand with it, which, if the priest was indulgent, might take a considerable time. The space of nine feet was measured by the accused himself with his own feet, and he would probably give but scanty measure. He was obliged only to touch one of the marks with the toe of his right foot, and allowed to stretch the other foot as far towards the other mark as he could: so that the conveyance was almost instantaneous. His hand was not immediately examined, but wrapped in cloth, prepared for that purpose, three days. From all these precautions may we not suspect that these priests were in possession of some secret that secured the hand from the impressions of such a momentary touch of hot iron, or removed all appearance of these impressions in three days; and that they made use of this secret when they saw reason? Moreover, we meet with no example of any champion of the church, who suffered the least injury from the touch of hot iron in this ordeal; but when any one was so fool-hardy as to appeal to this, or to that of hot water, with a view to deprive the church of any of her possessions, he never failed to burn his fingers, and lose his cause. Ducange Gloss. t. iii. Henry's Hist. vol. iii.

ORDEFF, or OREDEF, a word frequently used, in charters of privileges, for a liberty whereby a man claims the ore found in his own ground.

It properly signifies ore lying under ground; as a *delf* or *deff* of coal is coal lying in veins under ground.

ORDER, in *Architecture*. The word order is equivalent to arrangement, and in architecture may be considered as a decorated imitation of such a portion of a primitive hut, of a certain construction, as might comprehend the whole design by a continuity and repetition of its parts. The hut originally consisted of a roof or covering, supported by posts made of the trunks of trees, in four rows, forming a quadrangular enclosure. Beams were laid upon the tops of the posts, in order to connect them, in their longitudinal direction, in one body. To support the covering, timbers were laid from beam to beam across the breadth; and to throw off the wet, other beams were laid parallel to those resting upon the posts, but jutting farther over on each side of the edifice: and these again supported inclined timbers which overhung their supports, and formed a ridge in the middle of the roof for throwing off the wet; and thus the part supported formed three principal distinct portions, which, in process of time, were decorated with certain mouldings, or other ornaments, each part still preserving its distinct mass, though perhaps not exactly similar

to the original form. The three parts, taken as a whole, were called the entablature: the lower part, consisting of the linteling beams, was called the epistyle, or architrave; the middle part, which receded from the epistyle, was called the zoophorus, or frieze; and the upper part, which projected considerably over the epistyle, being in imitation of the ends of the roof, was called the cornice.

Therefore the entablature consists of a cornice, frieze, and architrave.

The posts received the name of columns, which always consist of two principal divisions at least, and frequently of three. The columns were ornamented at the top in imitation of the stones laid upon the posts in the original wooden hut, for throwing off the rain. These decorations at the top received the name of capital, and each of the wooden posts, that of shaft.

When ornaments were added to the foot of the shaft they were termed the base.

The order, therefore, consists principally of a column and entablature. The column is subdivided into a shaft and capital, or, at most, into three principal parts, a base, shaft, and capital; and the entablature, as has been observed, into architrave, frieze, and cornice. These parts are again divided into smaller portions, termed mouldings, or other ornaments.

There are three orders in architecture, though the modern writers generally enumerate five, but without any authority. These three orders are named Doric, Ionic, and Corinthian, according to the place in which they were invented.

Their history according to Vitruvius, is detailed under the article *CIVIL Architecture*.

Except in the general forms above specified, there is no standard of proportion common to the three orders, each having its own symmetry. The capitals are their distinguishing features. The Doric entablature is peculiar to the Doric. The Ionic entablature may be applied to the Corinthian with equal propriety, as the remains of Grecian antiquity amply testify. The proportions of columns vary in the three orders, from five to ten diameters, the standard being the diameter of a section of the shaft at the bottom. The shafts of the columns are the frustums of cones; they are sometimes of a conoidal form, which however is not so agreeable to the archetype as the conic frustum, and in the antique they are generally fluted. The fluting of the Doric is peculiar to itself. The columns of this order are in height fewer diameters than those of the other two; and supposing the diameter at the base in the three orders to be equal, the altitudes of the columns will increase from the Doric to the Corinthian, so that the Ionic column is the medium between the other two. The height of the entablature of each order may be generally stated at two diameters of its column. The diminution of the shafts is not equal in all the orders: that of the Doric varies from one-fourth to one-fifth, the Ionic and Corinthian from one-fifth to one-sixth. Neither are the cornice, frieze, or architrave in an equal ratio to each other. The height of the Doric cornice is about one-fourth of the height of the entablature; that of the Ionic one-third, and in most examples considerably more. The height of the architrave and that of the frieze of the Doric entablature are, in general, equal. In the Ionic and Corinthian the architrave is higher than the frieze, but of less height than the cornice. Though the moderns have classed two other orders with the three Grecian, they have no authority for this addition. Vitruvius mentions Tuscan temples and various kinds of capitals used for the Corinthian, but no where speaks of them as forming

a distinct order. The peculiarities of each are noticed under its respective title; see DORIC, IONIC, and CORINTHIAN Order. See also COMPOSITE and TUSCAN Order.

ORDER, *Attic*. See ATTIC.

ORDER, *Caryatic*. See CARYATIDES.

ORDER, *French*, is a new-contrived order, wherein the capital consists of attributes agreeing to that people, as cocks' heads, fleur de lis, &c.

Its proportions are Corinthian. Such is that of M. Le Brun, in the grand gallery at Versailles; and that of M. Le Clerc.

M. Le Clerc gives a second Tuscan order, and a Spanish order, besides his French order. The Tuscan he ranks between the first Tuscan and Doric. Its height he makes 23 semidiameters 22 minutes; the column to have 15, the pedestal 5, and the entablature 3, and 22 minutes: and he proposes its frieze to be adorned with turtles, which are the arms of Tuscany.

The Spanish order he places between the Corinthian and Composite. The whole order he makes 30 semidiameters, 28 minutes; of which the column has 9 and 25 minutes, the pedestal 16 and 18 minutes, and the entablature 4 and 15 minutes. The horns of the abacus he sustains with little volutes; the middle, in lieu of a rose, has a lion's snout; that animal being the symbol of Spain, and expressing the strength, gravity, and prudence of that nation.

There has been also an order, where lions and unicorns have been made to issue from the volutes, in compliment to the arms of the king of England, and called the *Britannic* order; but all these distinctions are alterations without improvement, and encumber rather than ornament the original figure of the antique capital.

ORDERS, *Greek*. See GREEK.

ORDER, *Gothic*. See GOTHIC.

ORDER, *Persian*. See PERSIAN.

In some cases the caryatides, or Persian order, is introduced as an attic, over columns; as in the front of the Royal Academy, in the Strand.

ORDER, *Rustic*. See RUSTIC.

ORDER, in *Astronomy*, &c. A planet is said to go according to the order of the signs, when it is direct; proceeding from Aries to Taurus, thence to Gemini, &c.—It goes contrary to the order or succession of the signs, when it is retrograde; *i. e.* when it goes back from Pisces to Aquarius, &c.

ORDERS, in *Systematical Botany*, are usually subdivisions of classes. The orders of Tournefort are distinguished by the fruit; those of Linnæus mostly by the number of styles, at least in his first thirteen classes; those of the 14th and 15th are discriminated by the fruit; of the 16th, 17th, and 18th, by the number of the stamens, which is likewise the case in the 20th, 21st, and 22d classes; the orders of the 19th class being characterised by the nature of the florets, while the orders of the 24th *Cryptogamia* are natural assemblages. See CLASSIFICATION and NATURAL Orders.

ORDERS, in *Law*, are of several sorts, and by divers courts; as of the chancery, king's bench, &c. Orders of the court of chancery, either of course or otherwise, are obtained on the petition or motion of one of the parties in a cause, or of some other interested in, or affected by it; and they are sometimes made upon hearing, and sometimes by consent of parties. *Pract. Solic.* 26.

ORDERS, in a *Military Sense*, denote all that is lawfully commanded by superior officers. Thus, orders are given out every day, whether in camp, garrison, or on a march, by the commanding officer; which orders are afterwards

given to every officer in writing by their respective serjeants.

The orders of the commander-in-chief are those which issue directly from his office, for the government of the army at large, or for any specific purpose. These orders are sanctioned by the king, and are irrevocable elsewhere.

General orders are such as are given by the general who commands; who issues them in writing to the adjutant-general, and he sends exact copies of them to the general officers of the day, and distributes them at his own quarters to all the brigade-majors, who daily go to head-quarters for that purpose, where they write down every thing that is dictated to them; and from thence they go and communicate the orders at an appointed place to the different majors or adjutants of the regiments which compose that brigade: they first read them to their colonels and lieutenant-colonels, or majors, and they dictate them to the serjeants of companies, and this is done by the serjeant-major, who writes them correctly down in their orderly books, and brings them to all the officers belonging to the company.

There are also *garrison, brigade, regimental, standing, &c.* orders.

ORDER, in *War*, denotes an arrangement of the parts of an army, either by land or sea, whether for marching, fighting, or engaging.

ORDER of Battle. See *BATTLE* and *LINE*.

An *ORDER of March* is disposed in two or three columns, according to the ground. The orders and evolutions make the subject of the science of tactics. See *EVOLUTION* and *MARCH*.

ORDER is more particularly used for the equal distance of one rank or file from another.

The usual order in files is three feet; in ranks six feet. The open or marching order is twice as much. See *MARCH*.

ORDER, Close, Open, &c. See *BATTALION*.

ORDER, in *Rhetoric*, is the placing of each word and member of a sentence in such a manner, as will most contribute to the force, beauty, or evidence of the whole; according to the genius and custom of different languages. With regard to order, we may observe in general, that, in English, the nearer we keep to the natural or grammatical order it is generally the best; but in Latin, we are to follow the use of the best writers; a joint regard being always had to the judgment of the ear, and the perspicuity of the sense, in both languages. See *DISPOSITION*.

ORDER is also used for a class or division of the members of the body of a state; with regard to assemblies, precedence, &c.

In this sense, order is a kind of dignity, which, under the same name, is common to several persons; and which, of itself, does not give them any particular public authority, but only rank, and a capacity of arriving at honours and employments.

To abridge this definition, order may be said to be a dignity attended with an aptitude for public employ. By which it is distinguished from an office, which is the exercise of a public trust.

In this sense, nobility is an order, &c. The clericate is also an order, &c.

ORDER is also the title of certain ancient books, containing the divine office, with the order and manner of its performance.

Roman order is that in which are laid down the ceremonies which obtain in the Romish church. See *RITUAL*.

ORDERS, by way of eminence, or *holy orders*, denote a character peculiar to ecclesiastics, whereby they are set apart for the ministry.

This the Romanists make their sixth sacrament.

In the reformed churches there are but three orders; viz. bishops, priests, and deacons. In the Romish church there are seven, exclusive of the episcopate: all which the council of Trent enjoins to be received, and believed, on pain of anathema.

They are distinguished into *petty*, or *secular orders*; and *major*, or *sacred orders*.

ORDERS, the petty, or minor, are four; viz. those of door-keeper, exorcist, reader, and acolyth.

Those in *petty orders* may marry without any dispensation: in effect, the *petty orders* are looked on as little other than formalities, and as degrees necessary to arrive at the higher orders. Yet the council of Trent is very serious about them: enjoins that none be admitted into them without understanding Latin: and recommends it to the bishops, to observe the intervals of conferring them, that the persons may have a sufficient time to exercise the function of each order: but it leaves the bishops a power of dispensing with those rules. so that the four orders are usually conferred the same day, and only make the first part of the ceremony of ordination.

The Greeks disavow these *petty orders*, and pass immediately to the sub-diaconate; and the reformed to the diaconate.

Their first rise Fleury dates in the time of the emperor Justinian. There is no call nor benefice required for the four *petty orders*; and a bastard may even enjoy them without any dispensation; nor does bigamy disqualify.

ORDERS, Sacred, or Major, we have already observed, are three; viz. those of deacon, priest, and bishop.

The council of Trent, retrieving the ancient discipline, forbids any person being admitted to the *major orders*, unless he be in peaceable possession of a benefice sufficient for a decent subsistence: allowing no ordinations on patrimonies or pensions: except where the bishop judges it for the service of the church.

A person is said to be promoted to orders *per saltum*, when he has not before passed the inferior orders. The council of Constantinople forbids any bishop being ordained without passing all the degrees; yet church history furnishes us with instances of bishops consecrated, without having passed the order of priesthood; and Panormus still thinks such an ordination valid.

ORDERS, Military, are companies of knights, instituted by kings and princes; either for defence of the faith, or to confer marks of honour, and make distinctions among their subjects.

There have been five orders, purely military, in England; viz. those of the knights of the Garter, knights Bannerets, knights of the Bath, knights Bachelors, and knights Baronets.

The French have had five military orders; viz. that of the Genette, instituted by Charles Martel; but which soon fell. The order of the Virgin Mary, since called the order of the Star, instituted by king John, in 1352. The order of St. Michael, instituted in 1469, by Lewis IX. The order of the Holy Ghost, or the Blue Ribband; the members of which are first to be knights of St. Michael. And the order of St. Louis, instituted by Louis XIV., in 1693. The princes of the blood, marshals of France, admirals, and generals, become knights of St. Louis by their offices.

ORDER of Alcantara, of Amaranth, of Argonauts, of the Band of Calatrava, of Christ, of the Cross, of the Elephant, of the Ermine, of the Golden Fleece, of St. James, of the Knot, of St. Lazarus, of the Rosary, of the Star, of the

the Stole, and of the Thistle, &c. See the respective articles. See the references under KNIGHTS.

ORDER of *Merit*. See MERIT.

ORDER of *St. Alexander Newski*, or the red ribband, was instituted by Peter I., emperor of Russia; but the czarina Catherine I. conferred it in the year 1725. See ALEXANDER NEVSKOI.

ORDERS, *Religious military*, are those instituted in defence of the faith, and privileged to say mass; and who are prohibited marriage, &c.

Of this kind are the knights of Malta, or of St. John of Jerusalem. Such also were the knights Templars, the knights of Calatrava, knights of St. Lazarus, Teutonic knights, &c. See MALTA, TEMPLAR, &c.

Father Putignani accounts those military orders where marriage is not allowed, real religious orders. F. Papebroch says, it is in vain to search for military orders before the twelfth century.

ORDERS, *Religious*, are congregations, or societies of monastics, living under the same superior, in the same manner, and wearing the same habit.

Religious orders may be reduced to five kinds; viz. monks, canons, knights, mendicants, and regular clerks. See MONK, CANON, &c.

Father Mabillon shews, that till the ninth century, almost all the monasteries in Europe followed the rule of St. Benedict; and that the distinction of orders did not commence till upon the re-union of several monasteries into one congregation: that St. Odo, abbot of Cluny, first began this re-union, bringing several houses under the dependence of Cluny: that, a little afterwards, in the eleventh century, the Camaldulians arose; then, by degrees, the congregation of Vallombrosa; the Cistercians, Carthusians, Augustines: and at last, in the thirteenth century, the Mendicants. He adds, that Lupus Servatus, abbot of Ferrieres in the ninth century, is the first that seems to distinguish the order of St. Benedict from the rest, and to speak of it as a particular order.

White order denoted the order of regular canons of St. Augustine. See AUGUSTINES.

Black order denoted the order of Benedictines.

These names were first given these two orders from the colour of their habit; but are disused since the institution of several other orders, who wear the same colours.

Grey order was the ancient name of the Cistercians; but since the change of the habit, the name suits them no more.

ORDER of *Charity*. See CHARITY.

ORDER of *St. Saviour*. See SAVIOUR.

ORDER, *Third*. See THIRD.

ORDER, in the *Geometry of Curves*. See GENDER, LINE, and CURVE.

ORDERS, *Book of*. See BOOK.

ORDER, *Interlocutory*. See INTERLOCUTORY.

ORDERIC, VITAL, in *Biography*, an ecclesiastical historian in the twelfth century, of French extraction, but born in England about the year 1075. When he was eleven years old he was sent to Normandy, where he took the religious habit in the abbey of Ouche, and in 1091, he was ordained subdeacon. It was not till 1108, when he was in his thirty-third year, that he received priests' orders from the hands of the archbishop of Rouen. He passed his life wholly occupied in study and devotion, without filling any of the posts belonging to his order. He died in 1143. As an author he is known by a work entitled "*Historia Ecclesiastica*, lib. xiii." containing the history of the Christian church, from the birth of Christ to the year 1142.

This work is said to furnish many interesting facts, not to be met with elsewhere, which relate to the histories of Normandy, of France, and England. It was first edited by Duchesne, among his "*Historia Normannorum Scriptores*." Gen. Biog.

ORDERLY SERJEANT, and *Orderly Men*, in *Military Language*, are those who are appointed to attend on general officers, or such other officers as are entitled to such, who walk behind them with their arms.

ORDERLY *Book*, is a book provided for every company, in which the serjeants write down both general and regimental orders, that the officers may read them.

ORDIK, in *Geography*, a town of European Turkey, in Bessarabia; eight miles N. of Imael.

ORDINAL, ORDINALE, a book containing the order or manner of performing divine service; and seems to be the same with that which was called the "pie" or "portuis," and sometimes "portiforium." See RITUAL.

ORDINAL, in *Grammar*, an epithet given to such numbers as mark the order of things, or in what rank they are placed.

Thus, first, second, tenth, hundredth, &c. are ordinal numbers. See CARDINAL.

ORDINANCE, or ORDONNANCE, a law, statute, or command, of a sovereign or superior.

Ordinance of parliament, is ordinarily used in the same sense as statute, or act of parliament.

In the parliament-rolls, acts are often called ordinances of parliament. Though in some cases we find a difference made between the two; ordinances being only temporary things, by way of prohibition; and capable of being altered by the commons alone; whereas an act is a perpetual law, and cannot be altered but by king, lords, and commons.

Sir Edward Coke asserts, that an ordinance of parliament differs from an act, as the latter can only be made by the king, and the threefold consent of the estates; whereas the former may be made by one or two of them.

Ordinance of the Forest, is a statute made in the thirty-fourth year of Henry I. relating to forest matters. See FOREST.

In the French jurisprudence, ordonnances are such laws as are established by the king's authority alone. All ordonnances begin with *à tous presens & à venir solut*. See CAPITAL.

ORDINANCE, or *Ordnance*, is also a general term for all sorts of great guns, or cannon, mortars, &c. used in war. See CANNON and GUN.

The strength and serviceableness of a piece of ordnance depends much on the thickness of the metal, especially about its chamber and breech, which is called its *fortification*.

Of this there were three degrees, both for cannons and culverins. Such were the ordinarily fortified, also called *legitimate pieces*. Those whose fortification is lessened, were called the *bastard pieces*. Those doubly fortified were called *extraordinary pieces*.

The fortification of a gun is reckoned from the thickness of the metal at the touch-hole, at the trunnions, and at the muzzle, in proportion to the diameter of the bore. For the dimensions of pieces of ordnance now in use, and of their various parts, see CANNON.

ORDINANCE, in *Painting*. See ORDONNANCE.

ORDINANCE, or *Ordnance Office*, is the standing grand magazine of arms, habiliments, instruments, and utensils of war, as well by sea as land; not only of those lodged in the Tower, but in all the garrisons, castles, forts, &c. in Great Britain,

Britain, from whence, as occasion requires, his majesty's armies are supplied.

The *board of ordnance* directs and regulates every thing that relates to the artillery and garrisons. In 1683, the superintendence of this board was committed to five chief officers, besides the master-general.

The first and principal is the *master-general*, from whom are derived all orders and dispatches relating to the same, as the service shall best require, and who has the sole command of the royal regiment of artillery. This post has often been annexed to the office of general and commander-in-chief. The same military respect is paid to the master-general of the ordnance, as to generals of horse and foot; that is, on all occasions to have the march beat to him, and to be saluted by officers, the colours excepted. The first master of the ordnance upon record was Rauf Bigod, who was appointed to this office for life 2d of June 1483.

Under him is a *lieutenant-general* of the ordnance, who receives orders from the master-general, and the rest of the prime officers at the board; sees them duly executed; orders the firing of guns on days of rejoicing; and sees the train of artillery fitted out when ordered to the field.

Next to him is the *surveyor-general*, who has the inspection of the ordnance, stores, and provisions of war, in the custody of the store keepers; he allows all bills of debts, keeps a check on labourers, &c.

Under these is a *clerk* of the ordnance, who records all orders or instructions given from the government of the office; with all patents, grants, names of officers, &c. draws all estimates for provisions, and supplies all letters, instructions, commissions, deputations, contracts, &c. and serves as a check between the two accountants of the office, the one for money, the other for stores.

This office has also a *store-keeper*, who takes into his custody all ordnance, ammunition, stores, &c. thereto belonging; and indents and gives in legal security for the safe keeping thereof; and renders an exact account from time to time.

Here is also a *clerk of the deliveries*, whose duty is to draw up all provisions, either at the Tower, or any other of his majesty's magazines, to see them duly executed, &c.

To this office also belongs a *treasurer* and *pay-master*, through whose hands passes the money of the whole office, as well for payment of salaries, as debentures.

Under these superior officers belonging to the civil branch of the ordnance, there are secretaries and clerks, &c. The military branch of the ordnance is under the direction of a chief engineer, &c. See *ENGINEER*.

ORDNANCE, or *Ordnance Bills*, commonly called *ordnance debentures*, are bills issued by the board of ordnance on the treasurer of that office, for the payment of stores, &c. These are not payable at any certain time, and do not bear any interest, so that the discount upon them is often very high: but they are seldom much above two years in arrear.

ORDNANCE, Spiking up the. See *SPIKING*.

ORDINARI, in *Antiquity*, were a sort of gladiators; being those appointed to exhibit combats on certain stated days, &c.

ORDINARIO, Ital. common, usual, in *Music*, as *tempo ordinario*, the usual time. These words are usually prefixed to movements in common time, for "moderately quick."

ORDINARY, something that happens, or passes frequently, or usually.

We say, the ordinary course of things: whatever is done without miracles, is done by ordinary agents.

ORDINARY Culverin. See *CULVERIN*.

ORDINARY Minion, &c. See *MINION, &c.*

ORDINARY. Ambassador, or Envoy in. See *EMBASSADOR, and ENVOY*.

ORDINARY is also applied to several officers and servants belonging to the king's household, who attend on common occasions. Thus we say, physician in ordinary, &c.

ORDINARY is a term applied to ships of war *laid-up* in harbours near the royal dock-yards. It is also the establishment of the persons employed by the government to take charge of them, which are so laid-up. These are principally composed of superintendent masters, warrant-officers, and servants of the said ships, except the purser, also a certain number of seamen in time of peace, according to the size of the ship. But in war there is a crew of labourers enrolled in the list of the ordinary, who pass from ship to ship occasionally to pump, clean, moor, or transport them whenever it is required.

The term ordinary is also applied to distinguish the inferior sailors from the able seamen. Thus the latter are rated *able* on the navy books, and have a monthly pay superior to that of those who are rated *ordinary*.

ORDINARY, Ordinarius, in the *Civil Law*, is any judge vested with authority to take cognizance of causes, in his own right, as he is a magistrate; and not by deputation.

ORDINARY Court of Chancery. See *PETTY Bag*.

ORDINARY, in *Common and Canon Law*, denotes him who has ordinary or immediate jurisdiction in ecclesiastical causes, as of course and common right; in opposition to persons who are *extraordinarily* appointed.

In which sense archdeacons are ordinaries. Though the appellation be most frequently given to the bishop of the diocese, who has the ordinary ecclesiastical jurisdiction, and the collation to benefices therein. However, in a more general acceptation, the word *ordinary* signifies (as above stated) any judge, authorised to take cognizance of causes in his own proper right, as he is a magistrate, and not by way of deputation or delegation.

There are several chapels, chapters, abbeys, &c. exempted from the jurisdiction of the ordinary.

The archbishop is ordinary of the whole province, to visit, and receive appeals from the inferior judicatures.

The Romish canonists call the pope *ordinary of ordinaries*, since by the Lateran council he has usurped the right of collating, by prevention, to all benefices; in exclusion of the ordinary collators.

ORDINARY of Assize and Sessions, was a deputy of the bishop of the diocese, anciently appointed to give malefactors their neck-verses, and judge whether they read or not; also to perform divine service for them, and assist in preparing them for death. So

ORDINARY of Newgate, is one who is attendant in ordinary upon the condemned malefactors in that prison, to prepare them for death; and he records the behaviour of such persons.

ORDINARY, or Honourable Ordinary, in *Heraldry*, a denomination given to certain charges properly belonging to that art.

The honourable ordinaries are by some writers reckoned ten in number; viz. the *chief, pale, bend, fesse, bar, cross, saltier, chevron, bordure*, and *orle*. See *CHIEF, PALE, &c.*

The heralds give several reasons for their being called honourable: viz. 1. Their great antiquity, as having been used ever since armory was set on foot. And, 2. Because they denote the ornaments most necessary for noble and generous men: thus the chief represents the helmet, wreath, or crown, covering the head; the pale represents his lance or spear;

spear; the bend and bar, his belt; the fesse, his scarf; the crofs and saltier, his sword; the chevron, his boots and spurs; and the bordure and orle, his coat of mail.

As to the allotting or distributing of these ordinaries, some authors write, that when a gentleman, having behaved himself gallantly in fight, was presented to the prince, or general, and a suitable coat-armour ordered him; if he were wounded in the head, they gave him a chief; if in the legs he had a chevron; and if his sword and armour were discoloured with the blood of the enemies, a crofs or bordure.

Some heralds have attempted to increase the number of honourable ordinaries to twenty; adding to those above mentioned, the *plain quarter*, the *giron*, the *escutcheon*, *cappe* dexter and sinister, *emmanch* dexter and sinister, *chauffe* dexter and sinister, and the *point*. But these are not yet authorized.

Some writers distinguish ordinaries into *honourable* and *subordinate*. Honourable ordinaries, which are the principal charges in heraldry, they define as made of lines only; which, according to their disposition and form, receive different names. Of these they reckon nine, viz. the *chief*, *pale*, *bend*, *bend sinister*, *fesse*, *bar*, *chevron*, *crofs*, and *saltier*. The subordinate ordinaries are ancient heraldic figures, frequently used in coats of arms, and distinguished by peculiar terms: these are the *giron*, *canton*, *fret*, *pile*, *orle*, *in-escutcheon*, *treasure*, *flanches*, *flafques*, *voiders*, *loxeuge*, *fusil*, and *masile*.

Mr. Edmondson reckons nineteen ordinaries; viz. *chief*, *pale*, *bend*, *fesse*, *bar*, *bordure*, *escutcheon*, *flafque*, *flanch*, *voider*, *crofs*, *saltier*, *chevron*, *fret*, *pile*, *gyron*, *quarter*, *canton*, and *file* or *label*; which see respectively.

ORDINATE. See CO-ORDINATE.

ORDINATES, in *Geometry* and *Conics*, are lines drawn from any point of the circumference of an ellipsis, or other conic section, perpendicularly across the axis, to the other side.

The Latins call them *ordinatim applicata*.

The halves of each of these are properly only *semi-ordinates*, though popularly called *ordinates*.

The ordinates of a curve may more generally be defined to be right lines parallel to one another, terminated by the curve, and bisected by a right line called the *diameter*. In curves of the second order; if any two parallel right lines be drawn so as to meet the curve in three points; a right line which cuts these parallels so, as that the sum of two parts terminating at the curve on one side the secant, is equal to the third part terminated at the curve on the other side; will cut all other right lines parallel to these, and that meet the curve in three points, after the same manner, i. e. so as that the sum of the two parts on one side will always be equal to the third part on the other side. And these three parts, equal on either side, sir Isaac Newton calls *ordinatim applicata*, or ordinates of curves of the second order. See CURVE.

ORDINATE in a *Parabola*, *Hyperbola*, and *Ellipsis*. See the respective articles.

ORDINATE *Ratio*, is that in which the antecedent of the first ratio is to its consequent, as the antecedent of the second is to its consequent.

ORDINATION, the act of conferring holy orders; or of initiating a candidate into the diaconate, or priesthood.

As to the qualification of the persons to be ordained, see DEACON and PRIEST.

The form of ordination in the church of England is annexed to the book of Common Prayer, and the authority

of it established by 5 & 6 Edw. VI. c. 1. 8 Eliz. c. 1. by art. 36. of the thirty-nine articles, by the eighth canon, and also by the act of Uniformity, 13 & 14 Car. II. c. 4. This act directs, that all subscriptions to be made to the thirty-nine articles shall be construed to extend (touching the 36th article above-mentioned), to the book containing the form and manner of making, ordaining, and consecrating of bishops, priests, and deacons in this act mentioned, as the same did heretofore extend unto the book set forth in the time of king Edward VI.

It is required, previously to ordination, by 1 Eliz. c. 1. and 1 W. c. 8. that every person taking orders, shall take the oaths of allegiance and supremacy before the ordinary or commissary: and by the 31 Eliz. c. 12. none shall be admitted to the order of deacon, or ministry, unless he shall first subscribe to all the articles of religion agreed upon in convocation in the year 1562, which only concern the confession of the true Christian faith, and the doctrine of the sacraments. By can. 36. no person shall be received into the ministry, except he shall first subscribe to the following articles: 1. That the king's majesty, under God, is the only supreme governor of this realm, and of all other his highness's dominions and countries, as well in all spiritual or ecclesiastical things or causes, as temporal; and that no foreign prince, person, prelate, state or potentate hath, or ought to have, any jurisdiction, power, superiority, pre-eminence or authority, ecclesiastical or spiritual, within his majesty's said realms, dominions and countries. 2. That the book of Common Prayer, and of ordering of bishops, priests, and deacons, containeth in it nothing contrary to the word of God, and that it may lawfully be used, and that he himself will use the form in the said book prescribed in public prayer, and administration of the sacraments, and none other. 3. That he alloweth the book of articles of religion agreed upon by the archbishops and bishops of both provinces, and the whole clergy, in the convocation holden at London, in the year of our Lord God 1562; and that he acknowledged all and every the articles therein contained, being in number thirty-nine, besides the ratification to be agreeable to the word of God. This subscription is to be made before the bishop himself. And for the avoiding all ambiguities, that person shall subscribe in this form and order of words, setting down both his christian and surname, viz. I N.N. do willingly and ex animo subscribe to these three articles above-mentioned, and to all things that are contained in them. And if any bishop shall ordain any, except he shall first have so subscribed, he shall be suspended from giving of orders for the space of twelve months. By can. 31. the ordination, as well of deacons as ministers, shall be performed in the time of divine service, in the presence not only of the archdeacon, but of the dean and two prebendaries at the least, or (if by any lawful cause they shall happen to be let or hindered) in the presence of four other grave persons, being masters of the arts at the least, and allowed for public preachers. In practice a less number than is required, either by the stat. 21 Hen. VIII. c. 13. or by the foresaid canon, is sometimes admitted; by virtue, as it is said, of the rubric in the office of ordination, which directeth, "that the bishops with the priests present shall lay their hands upon the persons to be ordained;" implying, as is supposed, that if there are but two priests present, it sufficeth by this rubric, which is established by the act of parliament of the 13 & 14 C. 2. For other particulars, see the form of ordination already cited, and the articles DEACON and PRIEST.

The council of Rome, in 744, orders that no ordinations shall be held except on the first, fourth, seventh, and tenth

tenth months. With us, by can. 31, ordination days are the four Sundays immediately following the Ember weeks; being the second Sunday in Lent, Trinity Sunday, and the Sundays following the first Wednesday after September the 14th, and December the 13th.

The ordination of bishops is more properly called *consecration*; which see.

Ordination has always been esteemed the principal prerogative of bishops; and they still retain the function as a kind of mark of spiritual sovereignty in their dioceses.

In the ancient discipline, there was no such thing as a vague, and absolute ordination; but every one was to have a church, of which he was to be ordained clerk, or priest. In the twelfth century they grew more remiss, and ordained without any title or benefice.

The council of Trent restored the ancient discipline, and appointed, that none should be ordained but those who were provided of a benefice sufficient to subsist them. The shadow of which practice still obtains among us.

The reformed hold the call of the people the only thing essential to the validity of the ministry; and teach, that ordination is only a ceremony, which renders the call more august and authentic.

Accordingly the Protestant churches of Scotland, France, Holland, Switzerland, Germany, Poland, Hungary, Denmark, &c. have no episcopal ordination. For Luther, Calvin, Bucer, Melancthon, &c. and all the first reformers and founders of these churches, who ordained ministers among them, were themselves presbyters, and no other. And though in some of these churches there are ministers called superintendants, or bishops, yet these are only *primi inter pares*, the first among equals; not pretending to any superiority of orders. Having themselves no other orders than what either presbyters gave them, or what was given them as presbyters, they can convey no other to those they ordain. On this ground the Protestant dissenters plead that their ordination, though not episcopal, is the same with that of all the illustrious Protestant churches abroad; and object, that a priest ordained by a Popish bishop, should be received into the church of England as a valid minister, rightfully ordained; whilst the orders of another, ordained by the most learned, religious presbyter, which any foreign country can boast, are pronounced not valid, and he is required to submit to be ordained afresh.

In opposition to episcopal ordination, they urge, that Timothy was ordained by the laying on of the hands of the presbytery (1 Tim. iv. 14.), that Paul and Barnabas were ordained by certain prophets and teachers in the church of Antioch, and not by any bishop presiding in that city (Acts xiii. 1, 2, 3.), and that it is a well known fact, that presbyters in the church of Alexandria, ordained even their own bishops for more than two hundred years in the earliest ages of Christianity. They farther argue, that bishops and presbyters are in scripture the same; and not denominations of distinct orders or offices in the church: referring to Philip. i. 1. Tit. i. 5, 7. Acts, xx. 27, 28. and 1 Pet. v. 1, 2. To the same purpose they maintain, that the superiority of bishops to presbyters is not pretended to be of divine but of human institution, not grounded on scripture, but only upon the custom or ordinances of this realm, by the first reformers and founders of the church of England, nor by many of its most learned and eminent doctors since. See Stillfleet's *Irenic*, chap. 8, p. 385. in which the learned author affirms and shews this to be the sentiment of Cranmer, and other chief reformers both in Edward VI. and queen Elizabeth's reign, of archbishop Whitgift, bishop Bridges, Loe, Hooker, Sutcliff, Hales, Chillingworth, &c.

Moreover, the book intitled the "Institution of a Christian Man," subscribed by the clergy in convocation, and confirmed by parliament, owns bishops and presbyters by scripture to be the same. Besides, the Protestant dissenters allege, that if episcopal ordination be really necessary to constitute a valid minister, it does not seem to be enjoined by the constitution of the church of England: because the power of ordination which the bishops exercise in this kingdom, is derived entirely and only from the civil magistrate; and he authoritatively prescribes how, and to whom ordination is to be given: that if an ordination should be conducted in other manner and form than that prescribed by him, such ordination would be illegal, and of no authority in the church. Accordingly the bishop at the ordination of the candidate asks, Are you called according to the will of our Lord Jesus Christ, and the due order of this realm? The constitution and law of England seem to know nothing of uninterrupted lineal descent, but considers the king, vested (by act of parliament or the suffrage of the people) with a fullness of all power ecclesiastical in these realms, as empowering and authorising bishops to ordain: and this power of ordination was once delegated to Cromwell, a layman, as vicegerent to the king. They farther think it strange, that the validity of orders and ministrations should be derived, as some have contended, from a succession of Popish bishops; bishops of a church, which, by the definition of the nineteenth article of the church can be no part of the true visible church of Christ, and bishops, likewise, who consider the Protestant clergy, although ordained by Protestant bishops, as mere common unconsecrated laymen. They object also to that subscription, which is the term of ordination in the church of England. See *Towgood's Dissent from the Church of England fully justified*, &c. edit. 5. 1779, p. 196, &c.

Pope Alexander II. condemns ordination *per saltum*, as they call it; i. e. the leaping to a superior order without passing through the inferior.

Ordination is one of the sacraments of the church of Rome.

ORDINE, order, arrangement; or the combination of many distinct things to make a whole. The term is used by the Italians in speaking of the music of the ancients for system: as *ordine di Mercurio, di Terpandro, di Filistao, di Pitagoro*, &c. to mark the order in which each of these authors arranged the sounds, in their several systems, their number, and what distance and proportion they gave them; and they say of a tetrachord, that it is in *ordine di quattro corde*: that is, entirely composed of, and divisible by, four strings or sounds. See TETRACHORD.

ORDINGEN, in *Geography*. See URDENGEN.

ORDNANCE. See ORDINANCE.

ORDORF, in *Geography*, a town of Saxony, in Thuringia; 10 miles S. of Gotha.

ORDONNANCE, or ORDINANCE, in *Painting*, denotes the disposition of the parts of a picture either with regard to the whole piece, or to the several parts; as the groups, masses, contrasts, aspects, &c.

In the ordonnance there are three things regarded; viz. the place, or scene, where; the distribution, how; and the contrast.

In the first, regard is to be had to the disposition of things to serve as a ground-work; and to the plan, or position of bodies: under the former of which come, 1. The *landscape*; whether an uninhabited place, where there is full liberty of representing all the extravagancies of nature; or inhabited, where the marks of cultivation, &c. must be exhibited.

2. The *building*, whether rustic; in which the painter's fancy

fancy is at liberty : or regular ; in which a nice attention is required to the orders.

3. The mixture of both ; in which it is a maxim to compose in great pieces, and make the ground-plot big enough, to neglect some little places, in order to bestow more on the whole mass, and to shew the more considerable places with the more advantage ; and to mark some agitation in all the things that move.

As to the *plans* of bodies, they are either solid ; which, again, are either so by nature, and which must be proportioned to their places ; or artificial, where regard is to be had to the rules of geometry, perspective, architecture, &c. Or they move : which they do, either by a voluntary motion, in which care must be had to proportion them to their situation, and to strengthen them by regarding the equilibrium ; or by some extraordinary power, as machines, &c. where the causes of their motions must appear. Or they are things at a distance. In all which an even plane must still be proposed to find their precise situation, and settle their place by sudden breaks and distances agreeable to perspective.

In placing the figures, regard must be had, 1. To the *group*, which connects the subject, and stays the sight. In this are to be considered the knot or nodus, which binds the group ; and the nearness of figures, which we may call the chain, as it holds them together ; that the group be sustained by something loose and distinct from it ; and by the same joined and continued to the other groups : and that the lights and shadows be so disposed, as that we may at once see the effect of all the parts of the composition.

2. To the *actions*, in which forced attitudes are to be avoided, and simple nature shewn in her most advantageous posture. In weak and lean figures, the nudities are not to be shewn ; but occasions of covering them are to be sought. In all human figures, special care to be taken, the head be well placed between the shoulders ; the trunk on the haunches ; and the whole on the feet.

3. To the *drapery* ; which is to be adjusted, so as it may appear real garments, and not stuffs loosely thrown on. The folds to be so disposed as to leave the great parts, in which the nudity may appear, free ; ranging the little folds about the joints, and avoiding them on the relieve of the members. And, lastly, to dispose the draperies, by raising the stuff, and letting it fall easily and lightly, that the air, sustaining the folds, may let them fall soft.

Lastly, in the *contrast*, are to be considered the actions, which vary infinitely : the aspects, which in actions of the same kind, may, by their difference, make a contrast : the situation, according as they meet above or under the sight, far or near. And, lastly, custom ; which extends, indeed, to all parts of painting, but is particularly to be regarded in the ordonnance ; to be managed discreetly, however, and stiffness and formality avoided.

ORDONNANCE, in *Architecture*, is nearly the same as in painting ; viz. the composition of a building, and the disposition of its parts, both with regard to the whole, and to one another.

Vitruvius defines ordonnance to be that which regulates the size or magnitude of all the parts of a building with respect to their use.

This definition is censured by M. Perrault, who takes the ordonnance to consist in the division of the plan or spot of ground on which the building is to be raised ; i. e. in the apportioning or laying it out, agreeable to the intended dimensions of the whole fabric ; which Mr. Evelyn expresses in fewer words, by “ determining the measure or what is assigned to compose the several apartments.”

On this foundation, ordonnance is the judicious contrivance,
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ance of the plan or model ; as when the court, hall, lodgings, &c. are neither too large, nor too little ; but the court, *v. gr.* affords convenient light to the apartments about it, and is large enough for usual access. The hall of fit capacity to receive company ; the bed-chambers accordingly, &c. When these divisions are either too great or too small, with respect to the place, as a large court to a little house, or a little chamber, in a magnificent palace ; the fault is in the ordonnance.

This the ancients called *taxis* ; and distinguished it from *diatexis*, disposition ; which is, where all the parts and members of a building are assigned their just places and situation with regard to their quality, office, rank, &c. without any regard to the dimensions, or quantity : as, that the vestibule or porch be before the hall, the hall before the parlour, and that before the withdrawing-room, &c. The bed-chambers, again, to look to the sun-rising ; and libraries, galleries of paintings, and cabinets of curiosities, &c. to the north.

ORDOVICES, in *Ancient Geography*, inhabitants of that country which is now called North Wales, and contains the counties of Montgomery, Merioneth, Carnarvon, Denbigh and Flint. These Ordovices, or as Tacitus calls them, Ordeuices, are supposed to have been originally of the same tribe or nation with the Huicii of Warwickshire, who were under some kind of subjection to the Cornavii ; but the Huicii of North Wales, being a free and independent people, were called Ordh-Huici, or the free Huici. When they were invaded by the Romans, they shewed a spirit worthy of their name, and fought with great bravery in defence of their freedom and independence. Though they sustained a great defeat from the Roman general Ostorius, in conjunction with the Silures, they maintained the war for a considerable time, until they were finally subdued, with great slaughter, by the renowned Agricola. It was partially owing to the nature of the country, and to the vicinity of Diva, now Chester, where a whole legion was quartered, that the Romans had so few towns or stations in the territories of the Ordovices. Mediolanum was the capital of the nation, and was probably situated at Maywood or Meifad in Montgomeryshire. In the time of the Romans this was a place of some note, but it was afterwards quite demolished by Edwin, king of Northumberland. Besides this, the Romans had a small number of other towns in this country ; as Segontium now Carnarvon, Conovium now Conway, and Varæ now Bodvay, all mentioned in the 11th journey of Antoninus. The country of the Ordovices was comprehended in the Roman province, which was called Britannia Secunda.

ORDUNA, in *Geography*, a small town of Spain, in the province of Biscay ; situated to the S. of Bilbao, in a pleasant valley, encompassed on all sides by high and steep mountains. It has two parish churches, a convent of monks, and another of nuns. The interior custom-house of Biscay is established here ; but it only collects the duties upon merchandize imported into Castile ; 42 miles S.W. of St. Sebastian. N. lat. 42° 56'. W. long. 2° 57'.

ORE, a town of Sweden, in Dalecarlia ; 60 miles N.N.W. of Fahlun.

ORES, in *Mineralogy* and *Metallurgy*, signify those mineral substances found in the earth, from which metals are procured. The ores of most of the metals consist of the metal combined with some other substance, and the process by which the metal is separated from the combined matter, is termed the reduction of the ore. We shall not here enumerate the ores of the different metals, as they are amply treated of under the respective metals.

Assay and Analysis.—This branch of operative chemistry.

is divided into two parts, the one called the humid, and the other the dry analysis. By the first of these, the substance is dissolved in acids or alkalies, and the different constituents separated by different re-agents. The dry process consists in first exposing the ore to a red heat, for the purpose of separating its volatile parts. The remainder is then treated with certain fluxes and inflammable matter, to separate the metal which is found in a rounded form, at the bottom of the crucible, and hence is called a button.

A little reflection will make it clear, that the humid analysis should always precede that of the dry. In order to know the nature of the particular flux to be employed after its ore has been roasted and its volatile products ascertained, it may be subjected to the action of some acid, and first the muriatic. If this has no action upon it, try the nitric; should this acid not dissolve the whole, try the nitromuriatic, which may consist of equal parts of the two acids. If the whole is not dissolved by this, it may be presumed that the ore contains flint, or some salt not decomposable by the above acids. Under either of these circumstances it is proper to fuse the ore with pure potash, in a silver crucible. The fused mass will be of a dark green if iron be present, of a grass green if the ore contain copper, blue with cobalt, yellow with lead, and purple with manganese. This mass being boiled for some time with distilled water, till all the soluble matter is taken up, must now be treated with nitric acid. It is probable that all, except the siliceous, will be dissolved in the acid. From this acid solution, with the different lists, it must be ascertained what are the constituents of the ore, and afterwards the different substances must be separated with a view to determine their proportions. See under the different metals *Assay and Analysis*.

When the nature and proportions of the different substances combined with the metal constituting the ore are made out, the next thing is to expose it in a crucible, with such substances as will combine with the matter to be separated, the compounds either becoming fusible or being separated in the form of gas. For instance, in the smelting of iron ores of the argillaceous kind, lime is used in order to form a fusible compound with the alumine, and charcoal or coal in order to form carbonic acid with the oxygen of the oxyd of iron. If the ore contain siliceous, potash or soda should be used in order to form glass, which is greatly more fusible than the earth would have been with the metallic oxyd alone. Borax is frequently employed as a flux from its great facility of combining with the siliceous and other earths. See STONES, *Analysis of*.

ORES, *Dressing, or Washing of*, is the preparing them as they come rough from the mine, for the working by fire: This is done several ways in different countries, and in respect to the different ores of the metals. In Devonshire we have a very easy method, which is so expeditious, and so good for all the purposes, that it is worthy of imitation in other places. After the ore is dug, it is tossed up by hand from shamble to shamble by the shovel-men in the mine, and drawn up in buckets by a winch at the top of the shaft. As soon as the whole quantity for one dressing is brought up, the large stones are broken, and the whole is then carried to the mills, where one horse turns a wheel that moves the machines for powdering a great quantity of it: these are called the stamping or knocking mills. The ore is unloaded at the head of the pass or entrance into these mills: this pass is made of two or three bottom-boards and two side-boards, in form of a hollow trough, and stands in a slanting direction. The ore by its own weight is carried down this trough, and lodges itself in the coffer. The coffer is a long square box, made of the firmest timber, and of three feet long, and a foot

and half broad. The ore is not suffered to fall into this all at once, but is stopped over the mouth of the trough by a cross board, where a cock turns in a quantity of water at the same time, which washes down just as much of the ore with it into the trough, as there ought to be. In this coffer there are three lifters placed between two strong board-leaves, having two braces or thwart-pieces on each side to keep them steady, as a frame with stamp-heads. These heads are of iron, and weigh about thirty or forty pounds a-piece, and serve to the breaking of the lumps of ore in the coffer.

The lifters are about eight feet long, and half a foot square. They are always made of heart of oak, and have as many in-timbers or guiders between them: they are lifted up in order, by a double number of tappets, which are fastened to as many arms passing diametrically through the great beam, which is either turned by the wheel and horse, or, where there is a convenience of water, by an overshot water-wheel on two boulders. The tappets exactly but easily meet with the tongues, which are so placed in the lifters, as that they easily slide from each other, and suffer the lifters to fall with great force on the ore in the trough. The frequent pounding of these soon reduces the large masses into a sort of sand, which is washed out of the trough by the continual current of the water from the cock through a brass-grate, which is placed at one end of the coffer between two iron bars. This operation is called by the miners *bricking*, or *brick-working* the ore. See BUDDLE.

The powdered ore is conveyed out of the trough into the *launder*, which is a trench cut in the floor of eight feet long, and ten feet over. This is stopped at the lower end with turf, so that the water is all suffered to pass away, and the powder of the ore is stopped. Thus the launder by degrees fills up with the dressed ore, and this is removed out with shovels, as occasion requires. The launder is divided into three parts, the forehead, the middle, and the tail: that ore which lies in the forehead, that is, within a foot and a half of the grate, is always the richest and best, and is laid up in a heap by itself; the middle and tail afford a poorer one, and these are sometimes laid up in separate heaps; sometimes thrown in one heap together.

ORES, *Assaying, or Assaying of*. See ASSAY, ORE *supra*, and the following references. See also Cramér's Art of Assaying.

ORES of *Antimony, Arsenic, Bismuth, Cobalt, Copper, Gold, Iron, Lead, Mercury, Platina, Silver, Tin, Zinc*. See the several articles.

ORES, *Smelting of*. See SMELTING.

ORE-Weed, in *Agriculture*, a general name for weeds growing at the bottom of the sea, and also on the muddy and rocky parts of the shore. These sorts of sea-weeds form so beneficial a manure, that farmers ought not to grudge the expence of carrying them a few miles. It is a practice in Devonshire, Cornwall, and some other maritime parts of England, to have these weeds laid in heaps till they are rotten, and then spread upon the land, about a load to three rods. But this lasts only one year, unless sand, or a stiff earth, according to the quality of the soil intended to be improved, be laid on or mixed with them; and then they become a lasting manure. In some places, these weeds are gathered in heaps, and burnt as soon as they are dry: after which, about a bushel of their ashes is laid upon three rods of ground. But these, like all other ashes, should be mixed with sand, or stiff earth, in order to have the land left good: otherwise they are only an improvement for a year. These ashes are particularly good for grass-grounds over-run with moss. Loose sandy soils are likewise peculiarly benefited by

by this weed; but being a submarine plant, the wind and soil soon exhale its moisture; so that the more speedily it is taken from the shore, where storms often throw it up in great quantities, the better it is. When spread on the ground, and afterwards covered over, it soon dissolves into a saline, mucilaginous, slimy matter, proper to fertilize and bind light soils. This is the most approved way of applying it; though some lay it naked and fresh from the sea, upon their barley land, towards the end of March and beginning of April, and have a good crop of corn; but such quantities of rank weeds are apt to shoot up afterwards, that no wholesome plant is to be expected that year.

It may be noticed, that the value of the lands on some of the coasts of Scotland has been more than doubled by the use of this excellent manure. It is chiefly used there for barley; and the farmers watch every opportunity, when it is thrown in by the sea, and lay it on at all seasons, in autumn, winter, and spring. But if they could choose their time, it would probably do best about the month of March; for being then ploughed into the ground, and afterwards ploughed up again to the seed, it would be better incorporated and blended with the soil: whereas, if it be laid on in autumn, before the fallowing or first ploughing, it is too much wasted before the spring; and if it be laid on the seed furrow, it is apt to burn the ground in a dry season, though it will do very well in this method in a wet summer. Its effects are but just felt the second year; though it is laid on thicker upon strong clay land, which receives no other manure for three crops, *viz.* barley, oats, pease and beans; a method which might perhaps be altered for the better, by omitting the oats, and sowing alternately barley, and pease and beans, and laying on the sea-ware, as these weeds are commonly called, for every second crop of pease and beans.

It would seem clear, from Mr. Scott's account of the manner of using the sea-ware in Scotland, as published by Mr. Maxwell, that much of this valuable manure must necessarily be lost through want of proper management, as they have no reservoirs to keep it in, when thrown ashore at a season in which they cannot use it, or where there is no ground in tilth, as is generally the case in winter, and during the busy part of their hay and corn harvest. It should be collected on these occasions, and lodged in a place free from any running water; and as it is equally beneficial to strong or light lands, it might be there covered with sand or clay, according to the nature of the soil for which it is intended. This will prevent its being parched by the sun, or its dissolving into a putrid mass, which, if not secured in this manner, would either be washed away by rains, or fly off into the air: whereas, when thus covered, it would greatly enrich the clay or sand, and render them good manures for their opposite soils. If it be thrown ashore at a time when it can be ploughed in directly, that is supposed the best manner of using it.

It is stated, that there is a kind of land all along the coast, which is gravelly, and covered over so thick with sea-stones, that, to look at it, one would not think corn could spring through them; and another sort of land, which is a deadish sand. To both these grounds sea-ware is the only manure; for dung of all kinds has been often tried, but with no success; and yet sea-ware makes them bring excellent crops of barley. This kind of ground is seldom ploughed more than twice, and the sea-weed is generally laid on before the first ploughing. Barley is sowed during two years, and pease the third; a fresh manure of sea-weed being laid on each year that barley is sown. As little wheat is cultivated in some parts, the farmers there might probably improve their practice of raising barley and pease, by sowing them

alternately, and laying the sea-ware to the pease. In the summer it is carried to a distance from the sea, and laid upon ley-ground, (arable land under grafs,) which, though in very ill heart, will bear a good crop of oats with only once ploughing, or of barley, if ploughed again in the spring.

But another kind of sea-ware, of a much stronger nature than that which is thrown up by the waves, is cut from the rocks at low water, and will last three years. It costs more labour, but brings greater recompence. The best time of laying this on the ground is supposed to be in autumn, before the land is ploughed rough for a spring crop. It is said that the farmers on the coasts of Scotland prefer this manure to any other, especially for their light grounds; and it has the advantage of being much more easily transported, because one load of it will go as far as two of dung. It does very well in kitchen gardens, where Mr. Scott has seen pot-herbs and roots of an extraordinary size produced by its help; and he has known fruit-trees, perfectly barren before, rendered extremely fruitful by laying this manure about the roots. See *SEA-Weed* and *MANURE*.

OREBRO, in *Geography*, a town of Sweden, the capital of the province of Nericia, or Nerik, situated near the western extremity of the lake Hielmar. Upon a small island in the centre, formed by two branches of the Swart, stands the castle, which was formerly a royal residence, and is now appropriated to the governor of the province. The inhabitants send iron, vitriol, and red paint to Stockholm; and the trade with that capital across the Hielmar and Mæler, by means of the canal of Arboga, is very considerable. The town possesses manufactories of fire-arms, cloth, and tapestry; 88 miles W. of Stockholm. N. lat. 59° 15'. E. long. 15° 4'.

OREBY-BUS, a town of Sweden, in Westmanland; 20 miles N. of Upsal.

ORECHOVITZ, a town of European Turkey, in Bulgaria; 28 miles W.S.W. of Nicopoli.

OREDESCH, a river of Russia, which runs into the Luga; 16 miles N. of Luga.

OREEHOUA, one of the smaller Sandwich islands, being a single high hummock, joined by a reef of coral rocks to the northern extremity of Oneeheow. The number of inhabitants is stated by captain King, in Cook's third Voyage, vol. iii. at 4000. N. lat. 22° 2'. E. long. 199° 52'.

OREGAN, or *River of the West*, a river of North America, which runs into the Pacific ocean, N. lat. 43° 18'.

OREGIUS, **AUGUSTINE**, in *Biography*, a learned Italian cardinal and philosopher, was born of parents in humble circumstances at Florence, in the year 1577. At a very early age he afforded striking indications of good natural abilities, and a great love of learning, and met with friends who sent him to pursue his studies at Rome. Here an adventure occurred to him, similar to that which befel the youthful Joseph, in the house of his Egyptian master, and he proved equally faithful to his duty. When cardinal Bellarmine was apprized of this fact, he took the young man under his particular patronage, and placed him in a college, where the young men of the principal families in Rome were educated. He improved the advantages of his situation with the greatest diligence and success, and became a proficient in the Greek tongue, in philosophy, and in several other branches of literature. Little is related with respect to the personal history of Oregius; but he appears to have entered into orders, and to have resided at first with cardinal Bellarmine, and afterwards with Barberini, who became pope by the name of Urban VIII. While the cardinal Barberini was

legate at Bologna, he employed Oregius to examine whether Aristotle taught the mortality of the soul, with the intention, should that be the case, of persuading the pope to prohibit his works as far as regarded that subject. On this occasion he vindicated Aristotle in a piece, entitled "*Aristotelis vera de rationalis Animæ Immortalitate Sententia*," which was published at Rome in 1631. He published other theological pieces about the same time. Upon the accession of Urban VIII. to the papal dignity, he made Oregius his divine, and in 1634 raised him to the purple, and presented him to the archiepiscopal see of Benevento. He died in the following year. He was author of a work "*De Angelis*," and another "*De Operibus sex Dierum*," which were printed at Rome in 1632. His works were collected and printed in a folio volume, in 1637. Bayle. Moreri.

OREGRUND, or OEREGRUND, in *Geography*, a seaport town of Sweden, in the province of Upland, situated on the sea-coast, and built in 1491 by some inhabitants of Oesthammar, who left that town because of the great decrease of water in the harbours, which entirely ruined its trade. Oregrund was a staple town till the year 1630, and has been three times burnt and quite demolished by the Russians. The harbour is defended from the violence of the sea by a mole; 34 miles N.N.E. of Upsal. N. lat. $60^{\circ} 20'$. E. long. $18^{\circ} 15'$.

OREILLARD, in the *Manege*. See *WIDE-EARED*.

OREILLE, Fr., *Orecchio*, Ital., the ear. This word, says Rousseau, is used figuratively as a musical term. To have an ear, is said of a person fond of music, whose auricular organ is well constructed, sensible, nice, and just in judging of the perfections and imperfections of musical tones, whether as to tune or time. With a bad or false ear, a finger neither sings in tune, nor can judge accurately of the intonations of others; and when insensible to the precision of measure, the time is broken and changed perpetually, without knowing it.

Thus, the word *ear* is always used for a discriminating quickness and delicacy in the sense of listening or hearing musical tones. See *EAR*.

OREL, in *Geography*, a town of Russia, and capital of the government of Orlovskoe, on the Oka; 176 miles S.S.W. of Moscow. N. lat. $52^{\circ} 56'$. E. long. 36° .

ORELIA, in *Botany*. See *ALLAMANDA*.

ORELIANA, FRANCIS, in *Biography*, a Spanish adventurer, celebrated as the first European navigator of the river Maragnon, was a young officer, second in command to Gonzalo Pizarro, in an expedition undertaken in 1540, from Quito in Peru, for the discovery of the inland country to the east of the Andes. The party had reached the banks of the Coca, a large river which discharges itself into the Maragnon, or Maranon, when they built a bark of green wood, for the purpose of assisting their progress, and manned it with fifty soldiers, under the command of Orellana. He embarked in February 1541, and committed himself to the current without compass or pilot, and actually reached the ocean in about seven months. He got safe to Cubagua, whence he sailed to Spain. (See *AMAZON*, *AMAZONIA*, and *MARANON*.) Ten years after this, he was entrusted with the command of three vessels from Spain, with which he perished, without having been able to discover the true mouth of the river, which he had before navigated, and which is sometimes now called by his name, as by the author of the *Seasons* :

"Swell'd by a thousand streams, impetuous hurl'd
From all the roaring Andes, huge descends
The mighty Orellana."

ORELLANA, in *Botany*. See *BIXA*.

ORELLANA, in *Geography*, a town of Spain, in the province of Estramadura, on the Guadiana; 24 miles E. of Merida.

ORENBURG, a town of Russia, and capital of a province, to which it gives name, in the government of Upha, on the Ural. This town with its fortrefs was built in 1738, by order of the empress Ann, at the conflux of the Or and Ural; but the situation being found inconvenient, the inhabitants were removed to a new town built lower down on the Ural in 1749: since the establishment of a considerable commerce here, all Russian and Asiatic merchants are permitted, on paying a certain duty, to sell their goods by wholesale or retail; and all European merchants are allowed to bring their goods from the harbours and frontier towns to Orenburg; 180 miles S. of Upha. N. lat. $51^{\circ} 42'$. E. long. $55^{\circ} 14'$.

ORENSE, AURIA, or *Aquæ Calidæ*, a city of Spain, in Galicia, so ranked as the see of a bishop, situated at the foot of a mountain, upon the left bank of the Minho. In the time of the Gothic princes, the bishop was suffragan to the archbishop of Braga in Portugal; but after the invasion of the Moors, he became dependent on the archbishop of Compostella. Its hot springs were famous in ancient times; whence it obtained the name of "*Aquæ Calidæ*;" and it is said that they have an effect on the temperature of part of the town, and the adjacent country. The town is small, but airy and tolerably well built; its streets are straight, and its squares regular. It has a cathedral and parish church, and a chapter, the members of which are numerous. Here are also two convents of monks; one that belonged to the ancient Jesuits; two chapels; a house of instruction for girls; an hospital for the sick poor; and an asylum. The population is calculated at 2300 persons. Here is a remarkable bridge of one arch, so lofty that a ship can pass under it. The plain of Orense is beautiful, pleasant, and fertile, abounding with excellent grapes and good fruits; 37 miles S.E. of Compostella. . lat. $42^{\circ} 25'$. W. long. $7^{\circ} 53'$.

OREO, a town of the island of Negropont; 44 miles N.N.W. of Negropont. N. lat. $39^{\circ} 7'$. E. long. $23^{\circ} 18'$.

OREOBOLUS, in *Botany*, from *oros*, a mountain, and *βολος*, a mass, lump, or clod, alluding to its place and form of growth. Brown Prodr. Nov. Holl. v. 1. 235. Class and order, *Triandria Monogynia*. Nat. Ord. *Calamariæ*, Linn. *Cyperoidæ*, Juss. *Cyperacæ*, Br.

Ess. Ch. Glumes two, spathaceous, deciduous, including one floret, sometimes accompanied by an inner scale. Corolla (perianth of Brown) in six deep segments, cartilaginous, remaining after the fall of the fruit. Style deciduous. Stigmas three. Nut crustaceous.

1. *O. Pumilio*. Gathered by Mr. Brown in Van Diemen's land. A dwarf plant, forming broad, dense, convex tufts, on the summits of the mountains. Stems divided in the lower part, densely clothed with imbricated, straight, sheathing, ribbed, spreading, linear leaves, dilated at their base. Stalks axillary, short, compressed, single-flowered. The glumes compose a two-valved two-edged sheath.

OREOCALLIS, so named by Mr. Brown, from *oros*, a mountain, and *καλος*, beautiful. Brown Tr. of Linn. Soc. v. 10. 196. Class and order, *Tetrandria Monogynia*. Nat. Ord. *Proteacæ*, Juss.

Ess. Ch. Corolla irregular, split on one side, four-toothed. Stamens sunk in the concave tips of the corolla. Nectariferous gland none. Germen stalked. Stigma oblique, orbicular, dilated, rather concave. Follicle cylindrical. Seeds numerous, with a terminal wing.

1. *O. grandiflora*. *Embothrium grandiflorum*; Lamarck Dict. v. 2. 354. Willd. Sp. Pl. v. 1. 538. (*E. emarginatum*; Ruiz and Pavon Fl. Peruv. v. 1. 62. t. 95.)—Native of the colder mountains of Peru. A perfectly smooth shrub, twelve feet high. Stem erect, branched, the branches round, granulated. Leaves scattered, stalked, elliptic-oblong, four inches in length, coriaceous, slightly revolute, entire, emarginate, with a minute point, single-ribbed, with many transverse veins. Clusters terminal, solitary, erect, dense, of numerous rose-coloured flowers in pairs, each pair with a minute bractea at the base of their partial stalks, but no general involucre. This splendid plant flowers in September and October, when it is used to ornament the temples and idols of the Peruvians. Its habit is altogether like that of the *Embothrium coccineum* of Forster and Linnaeus, and of the *E. speciosissimum* of Smith, New Holl. Bot. t. 7. Sims in Curt. Mag. t. 1128. We presume to think there ought to be no generic division of these plants, though the present wants the nectariferous gland beneath the germen, which the others have. The stigma indeed, which is vertical and club-shaped in *Embothrium*, seems a most important mark.

OREON, a name given by the ancients to a kind of horse tail which they found growing on the mountains in wet and damp places. It is to this species that many authors have attributed the principal virtues of the genus; and this seems to have been the same with our great water horse-tail. Neophytus says, that it rose up with a single stalk resembling a young reed, and that this was composed of several joints, which, in the manner of cups, were inserted one into another; and that from these joints the leaves grew, and that they resembled those of the pine-tree. The branches are what this author calls leaves, and they do pretty well resemble the leaves of the pine-tree. They are long and slender, and of a bright green. Our great horse-tail loves the heads of springs in hilly countries, and is always most plentiful in such places.

OREOSELINUM. See ATHAMANTA.

ORES, in Geography, a town of the island of Sardinia; 16 miles S.S.E. of Orestagni.

ORESA, a town of Lithuania, in the palatinate of Novgorod; 18 miles E.N.E. of Sluck.

ORESME, NICHOLAS, in Biography, an eminent French prelate, and one of the most celebrated writers in the 14th century, was born at Caen in Normandy. He pursued his studies at the university of Paris, where he entered himself a member of the college of Navarre, and was in due time admitted to the degree of doctor by the faculty of the Sorbonne. In 1355, he was elected grand master of the college in which he was educated; and Mr. Launoy says that he greatly contributed to the revival of learning in that seminary. He rose successively to various high stations in the church; and in 1360, king John appointed him preceptor to his son Charles, who became the fifth king of France of that name. In 1363, he was sent to transact affairs of importance with pope Urban V., and the college of cardinals at Avignon, and on this occasion he signalized himself by a discourse which he delivered before the pope and cardinals, in which he inveighed bitterly against the scandalous irregularities of the papal court. This discourse was published by Gesner at Wittemberg in 1604. Oresme next excited much attention by another "Discourse concerning the Changes in the Value of Money," in which he censured the conduct of those princes who coined money below the just standard, and maintained that they had no power to increase or depreciate the value of money at their arbitrary pleasure. This dis-

course is inserted in the twenty-sixth volume of the Bibl. Patr. Upon the accession of Charles V. to the throne he loaded his former tutor with favours, and consulted him on the most important affairs of government. In 1377, he nominated him to the bishopric of Lisieux, over which he presided till his death, in the year 1382. His acquaintance with divinity, philosophy, the mathematics, and the belles lettres, was very extensive, and profound for the age in which he lived. De Launoy, Dupin, Huet, and others contend that he translated the Bible into French by order of Charles V.; but others, among whom is father Simon, in his "Critical History of the Versions of the New Testament," maintain that it was the work of Des Moulins, canon of Aire, who lived a hundred years before Oresme, and some say it was done by Raoul des Presles, an eminent contemporary of our author. It is not in our power to give any decision on this subject. Oresme translated into French Aristotle's "Morals and Politics," by order of Charles V.: he was likewise the translator of some parts of Cicero's works; and the treatise of Petrarch, "De Remediis Utriusque Fortunæ." He was author of many original pieces, among which were three treatises against judicial astrology. Moreri.

OREXIS, APPETITE. The appetite, when excessive, or otherwise vitiated, is distinguished by medical writers into several kinds, and described under several names, according to its difference in degree, and other particulars.

The first kind is the *Addephagia*: this is the name given to that species in which the food is not only eaten in too large a quantity, but is swallowed in a particularly ravenous manner.

The second is the *Orexis Canina*: in this case the patient is continually eagerly longing for food; and if it is not ready so soon as he desires, he is subject to fainting-fits; after the recovery from which he does not feel the same craving appetite. See BULIMY.

The third is the *Pica*, or *Sitta*: this is the case when the patient has an eager appetite to things not fit for food; such as chalk, cinders, tobacco-pipes, and the like.

The fourth is the *Malacia*: this is distinctively made the name of that species of excessive appetite in which the patient has a great desire for some particular things, but those of the nature of common food, and usually of the nicer and more delicate kind. See APPETITE.

OREYPOUR, in Geography, a town of Hindoostan, in Marawar; 25 miles N. of Ramanadporum.

OREZA, a town of the island of Corsica, in the department of Corte. The canton contains 4345 inhabitants.

ORFANEL, HYACINTH, in Biography, a Spanish Dominican monk, who became a martyr to his zeal for propagating the Catholic faith in Japan, was born in the kingdom of Valencia in the year 1578. He entered, when very young, into the order of St. Dominic; and in the year 1605, was sent out a missionary to the Philippine islands. From thence he went to Japan, where he chiefly applied himself to the instruction of the poor, among whom he made many converts to the Catholic religion. While thus engaged, in what he considered a good cause, he endured great privations and sufferings, and was at length arrested, brought to a mock trial, and condemned to be burnt alive. This was in the year 1622. He contributed very much to the collection of missionary travels among the Pagans of the East, a work that was written in the Spanish language, which relates to a country little known to Europeans, and is said to abound in curious and interesting matter. So careful was the author to render his work perfectly accurate, that while he

was in prison, he read it to his fellow missionaries, who assisted him in correcting any mistakes into which he might have fallen. It was printed at Madrid in 1633, and is entitled "The Ecclesiastical History of the Success of Christianity in Japan from the Year 1602 to 1621, and continued to the End of the Year 1622 by father Diego Collado." Moreri.

ORFAR, a town of Scotland, on the S. coast of the island of Pomona; ten miles S.W. of Kirkwall.

ORFFYREUS's WHEEL, in *Mechanics*, is a machine so called from its inventor, which he imagined to be a perpetual motion. This machine, according to the account given of it by M. s'Gravefande, in his "*Œuvres Philosophiques*," published by Allamand, Amst. 1774, consisted of a large circular wheel, or rather drum, twelve feet in diameter, and fourteen inches in depth, and very light; as it was formed of an assemblage of deals, the intervals between which were covered with waxed cloth, in order to conceal the interior parts of it. The two extremities of an iron axis, on which it turned, rested on two supports. On giving the wheel a slight impulse in either direction, its motion was gradually accelerated; so that after two or three revolutions it acquired so great a velocity as to make twenty-five or twenty-six turns in a minute. This rapid motion it actually preserved during the space of two months, in the chamber of the landgrave of Hesse, the door of which was kept locked, and sealed with the landgrave's own seal. At the end of that time it was stopped, to prevent the wear of the materials. The professor, who had been an eye-witness to these circumstances, examined all the external parts of it, and was convinced that there could not be any communication between it and any neighbouring room. Orffyreus, however, was so incensed, that he broke the machine in pieces, and wrote on the wall, that it was the impertinent curiosity of professor s'Gravefande which made him take this step. The prince of Hesse, who had seen the interior parts of this wheel, being asked by s'Gravefande, whether, after it had been in motion some time, there had been any change observable in it, or whether it contained any pieces that indicated fraud or deception, answered both questions in the negative, and declared that the machine was of a very simple construction.

ORFO, in *Geography*, a town of Africa, in the district of Labadde, on the Gold Coast.

ORFORD, or OREFORD, a borough and market town in the hundred of Plomegate, and county of Suffolk, England, is situated on the north-west bank of the river Ore, from which it certainly derived its name. It was formerly a place of much greater consequence than at present, and previous to the year 1500, contained three churches; but of these only one remains. In 1359 this town sent three ships and sixty-two men to assist Edward III. in the siege of Calais. Here, according to the "*Suffolk Traveller*," was a house of Augustine friars, an hospital of St. Leonard, and a chantry, which was valued at the dissolution at *6l. 13s. 11½d.*; and there are several lanes within the borough, and in its immediate vicinity, still called streets, though almost entirely destitute of houses. The decay of the town is attributed to the loss of its harbour, as the sea has retired from this part of the coast.

The corporation of Orford consists of a mayor, recorder, town clerk, eighteen portmen, twelve capital burgesses, and two serjeants at mace. Two members are sent hence to parliament, in which the town appears to have been first represented in the reign of Edward I. Neglecting, however, to exercise its elective franchise during a long series of years, it lost this privilege, but it was restored by Richard III.,

who granted to Orford a charter of incorporation, and conferred on it many important immunities. Its market is on Monday, weekly, and there is a fair on the 24th of June: that formerly held on Shrove Monday is discontinued. This town gave the title of earl to admiral Russell, who was elevated to the peerage by William III. Becoming extinct in that family, the same dignity was conferred on the celebrated sir Robert Walpole, and continued in his family till the year 1797, when it again became extinct, by the demise of Horatio, the fourth earl, without issue. It has since, however, been once more revived, in the person of Horatio baron Walpole of Wolterton.

The church of Orford is of great antiquity, and was, when entire, a spacious and very handsome structure. At the west end rises a square embattled tower, having under it the principal entrance, which is adorned on the outside with shields, and a cross over the centre, and in the interior with king's heads, five on one side, and six on the other. The chancel, now much more ruinous than any other part of the church, and separated from it by a wall, exhibits in its remains a very curious specimen of ancient architecture. In the more entire portions of this edifice the arches are in the pointed style, and the windows are ornamented with beautiful tracery, in good preservation.

The other public buildings in Orford, besides the church, are a town-hall and an assembly house.

On an eminence on the west side of the town stand the ruins of the castle, which was most likely founded soon after the Norman conquest, though neither the exact period, nor the name of the founder, are recorded. This fortress is traditionally said to have been the centre of the town in ancient times; a report rendered extremely probable by the fact, that many foundations of buildings are frequently discovered in the surrounding enclosures, some of which likewise retain the name of streets annexed to their denomination of field. The present remains of the castle consist chiefly of the keep. The figure of this building is a polygon of eighteen sides, described within a circle, whose radius is twenty-seven feet, and flanked by three square towers, situated at equal distances on the west, north-east, and south-east sides. These are embattled, and overlook the rest of the edifice, which rises to the height of ninety feet. The outer walls measure twenty feet in thickness, and are solid towards the base, but galleries and small apartments are formed in them towards the upper part. Round the whole run two circular ditches, which were formerly separated by a circular wall, now almost entirely demolished. From the view of the castle, however, published by Grose, we learn that this wall was forty feet high, and had a parapet and battlements. The entrance into the fortress was, on the south-east part of the polygon, through a building adjoining to one of the towers.

When mention of Orford castle first occurs in history, it belonged to the crown. In 1215, Hugh Bigod and John Fitz Robert were appointed governors both of Norwich and Orford castles; but were removed the same year, and Hubert de Burgh nominated in their stead. After the battle of Lewes, at which Henry III. was taken prisoner by his barons, they conferred the command of this post on Hugh le Despenser. It next passed into the custody of the descendants of Peter de Valoines, one of whom, Cecilia, daughter of Robert de Valoines, married Robert de Ufford, who had a grant of the castle and manor for life. William de Ufford died seized of it in the reign of Richard II., and Isabel, his wife, had it assigned among other things for her dowry. Upon her death it reverted to Robert lord Willoughby, a descendant, by the female line, from Robert de Ufford, and continued

tinued in that family till the reign of Henry III. It descended afterwards to Michael Stanhope, and in his right to viscount Hereford, whose trustees sold it to the father of the marquis of Hertford, the present owner.

Sudborne Hall, a seat of the marquis, stands about a mile north-east from the town. It is a plain building, and chiefly used as a sporting residence, for which purpose it is excellently situated, the park and neighbourhood abounding with game. The Suffolk Traveller, by John Kirby, 2d edit. Lond. 1764. Beauties of England and Wales, vol. xiv.

ORFORD, a post-town of America, in Grafton county, New Hampshire, on the E. bank of Connecticut river, about 15 miles N. of Hanover, and opposite to Fairlee in Vermont : incorporated in 1761, and containing 988 inhabitants. Here are the soap-rock, which has the property of fuller's earth in cleaning cloth, alum ore, free-stone fit for building, and a grey stone, much used for mill-stones, and reckoned equal in quality to the imported burr-stones.—Also, a township in Lower Canada, W. of Alcot, having about 30 inhabitants. In the northern part is a considerable lake, and another in the southern part of the township.

ORFORD, *Cape*, the north-westernmost of the large islands to the W. of Falkland's found in the Falkland islands, in the Atlantic ocean, and S.E. of Cape Percival.

ORFORD, *Township of*, lies in Suffolk county, Upper Canada : to the N. and S. is the residence of the Moravians : on the S. it is bounded by lake Erie, and towards the N. watered by the Thames.

ORFORDNESS, a cape of England, on the S.E. coast of the county of Suffolk, in the German sea, where a light-house is erected for the direction of ships. N. lat. $52^{\circ} 4'$. E. long. $1^{\circ} 6'$.—Also, a cape on the E. coast of New Holland. N. lat. $11^{\circ} 15'$. W. long. $218^{\circ} 9'$.

ORFUS, in *Ichthyology*, a species of *Cyprinus* ; which see.

ORGABRA, in *Geography*, a town of Africa, in the kingdom of Magadoca.

ORGAL, or ARGOL, the lees of wine dried, and used by dyers to prepare the cloth for the more readily taking their several colours. See TARTAR.

ORGAN, *ὄργανον*, is used in the general for any thing framed and destined for some certain action, use, or operation.

ORGAN, or *Organical Part*, in *Physiology*, is such a part of the body as is capable of the performance of some perfect act, or operation.

In which sense all the parts, even the most simple, may be denominated *organical*.

The organs are divided into *primary* and *secondary*. The *primary* are those composed of similar parts, and appointed for some one single function. Such as consist of several of these, though appropriated to one single action, are esteemed *secondary* organs.

Thus the veins, arteries, nerves, and muscles, are *primary* organs ; and the hands, fingers, &c. are *secondary* organs.

ORGAN of *Sense*, is that part of an animal body, by means of which it perceives external objects.

These, some divide into *internal*, which is the brain ; and *external*, viz. the eye, ear, nose, &c.

ORGAN, in *Fortification*. See ORGUES.

ORGAN, in *Music*, the name of the largest, most comprehensive, and harmonious of musical instruments ; on which account it is called "the organ," *ὄργανον*, "the instrument" by way of excellence. The invention of the organ is very ancient, though it is agreed, it was little used till the eighth century. It seems to have been borrowed from

the Greeks. Vitruvius describes one in his tenth book. The emperor Julian has an epigram in its praise. St. Jerom mentions one with twelve pair of bellows, which might be heard a thousand paces, or a mile ; and another at Jerusalem, which might be heard to the mount of Olives.

Ancient annalists, says Dr. Burney, are unanimous in allowing, that the first organ which was seen in France was sent from Constantinople, as a present from the emperor Constantine Copronymus VI. in 757, to king Pepin ; which, as well as Julian's epigram, gives the invention to Greece, where the hydraulicon had likewise its origin.

It has been a subject of debate, when the use of organs was introduced into the church. Bellarmine says, that they began to be used in the service of the church, in the time of pope Vitalian, about the year 660, as Platina relates out of the Pontifical ; or, as Aimonius thinks, after the year 820, in the time of Lewis the Pious. A learned writer has shewn, that neither of these dates can be just ; alleging that Thomas Aquinas expressly says, that in his time, i. e. about the year 1250, the church did not use musical instruments, lest she should seem to judaize. Pierce's Vind. of the Dissenters, ed. 1718, p. 395.

Bingham, in his Antiq. of the Christian Church, vol. i. p. 314. folio ed. adds, that Marinus Sanutus, who lived about the year 1290, first brought the use of them into churches. However, it appears from the testimony of Gervas, the monk of Canterbury, who flourished about the year 1200, that organs were introduced more than one hundred years before this time : in his description of Lanfranc's church, as it was before the fire in 1174, he has these words, "Crux australis supra fornicem organa gestare solebat." Decem Scriptores, p. 1293, line 25.

Venerable Bede, who died in 735, says nothing of the use of organs, or other instruments, in our churches or convents, when he is very minutely describing the manner in which the psalms and hymns were sung. However, according to Mabillon and Muratori organs became common in Italy and Germany during the tenth century, as well as in England ; about which time they had admission in the convents throughout Europe. Burney's Hist. Music, vol. ii. p. 66. 114.

Our elegant poet, the late Mr. Mason, a good musician, interested himself much in enquiries concerning the progress of the art, in his "Essays on English Church Music." He there gives several historical notices concerning the origin and progress of the organ, previous to its general admission into our churches, partly extracted from a very voluminous work, entitled "L'Art de Faicteur des Orgues, par D. Bedos de celles," a Benedictine monk, printed in 1766. We have not room to extract from Mr. Mason's little work, and can only refer to it.

The complicated nature of the mechanism of an organ, renders it a very difficult task to give a clear description of it. To make it more intelligible, we shall separately describe the several parts ; and then, by referring the reader to a plate of the interior of a church organ, shew the dispositions and uses of them when put together.

The modern organ consists of several parts ; viz. the bellows, the porte vent, or wind trunk, the wind chest and its furniture, the sound boards, the sliders, the stock and rack boards, the pipes, the key and draw-stop movements.

The bellows are of two kinds, single and double ; the former are commonly used in church organs, the latter in chamber organs. Single bellows consist of two oblong boards, *a b, c d*, (Plate I. Organ, fig. 10.), connected at *b* by a joint of leather

leather or web, and at the other three sides by thin folds of wood joined together with leather. The lower board is fixed, the upper moveable. In the lower board, at *ef*, is an aperture covered with a valve, (called by the organ builders a pallet,) opening inwards. At *g* is another aperture, covered with a hollow box *g d*, communicating with the wind trunk; upon the mouth of which, is another pallet opening outwards. When the upper board, *ab*, is raised by pressing down the handle of the lever *hi*, the air enters the bellows at the aperture *ef*, and upon letting go the lever, is forced into the wind trunk at *d*, by the pressure of weights placed upon the upper board. The pallet at *d* prevents the return of the wind from the wind trunk, when the upper board is raised. It will easily be seen, that it is necessary to have at least two pairs of bellows of this kind, to keep up a constant supply of wind. Most of the English church organs have three; and many of the large German instruments (as Dr. Burney informs us) have twelve and even sixteen pairs.

Double bellows are made with three boards; *ab*, (*fig. 11.*) the riser; *c d*, the middle; and *e f*, the feeder boards. At *g*, in the feeder, is an aperture, and pallet to receive the air; at *h*, in the middle board, is the pallet of communication; and at *i*, in the riser, the waste pallet, which is contrived to open, when the bellows are sufficiently full. The riser empties itself into the wind trunk at *c*. In old bellows of this kind, the riser is connected with the middle board, in a manner similar to the single bellows; but it is now usual to join them with folds of an equal breadth in all parts, so that the upper board, in rising, is always parallel to the middle board. These are called horizontal bellows; in contradistinction to those which rise diagonally. Their action is very superior to those of the old form. They afford a greater quantity of wind, in proportion to the case room they occupy; the pressure is more equal; and they are not liable to jerk or quiver. Though lately brought into common use, they are by no means a modern invention, as Père Merfenne describes them under the name of bellows "à la lanterne." *L'Harmonie Universelle*, folio, Paris, 1636.

The found board (*fig. 12.*) is made of an oblong frame, the upper side of which is covered by a stout board. In the two longest sides of the frame, and in the under side of the board, grooves are dug, in which are fixed a number of bars of wood; dividing the box thus formed into parallel channels, completely separated from each other. A number of holes, corresponding with the number of ranks of pipes of which the organ consists, are bored through the upper side of the found board into each channel. The number of channels is regulated by the compass of the organ; there being usually a channel to each finger-key.

The wind chest is attached to the under side of the found board. It is a box made air-tight in all parts, so that the wind, which it receives from the bellows through the wind trunks, cannot escape, except through the channels of the found board. Each of the channels within the wind chest is covered with a pallet, which opens downwards, and is closed by the action of a spring of brass wire. The pallet is connected with the key movement by small wire hooks, which pass through a perforation in a brass plate, upon the bottom of the wind chest. *Plate I. fig. 2.* shews a pallet with its spring, chest hook, and pull-down. All the under side of the found board, which is without the wind chest, is closely covered with leather, or parchment.

Upon the upper side of the found board are placed thin

bars of wood, called the sliders; extending the whole length of the found board, and pierced with holes, corresponding with those bored through the found board, into the channels. These sliders, being moveable in grooves in a transverse direction to the channels, admit, or exclude, the wind from any rank of pipes placed over them, as the holes correspond with, or cover, those of the found board. Lastly, upon these are screwed the stock boards; which are also bored with holes corresponding with those in the sliders and found board; in which the pipes are placed. The racks are thin boards mounted on small pillars, pierced to receive the upper part of the feet of the pipes.

The key movement is a combination of rollers and levers, or of quadrants connected by wooden rods; so contrived, that each key, when pressed down, may open its corresponding pallet in the wind chest, and so admit the wind to the pipes, standing over the channel, which the pallet covers.

The draw-stop movement is also a combination of levers and rollers, so contrived, that each draw-stop may open or shut its corresponding slide; and so admit or exclude the wind from that rank of pipes to which it belongs. Those ranks of pipes, which in the construction of the instrument are so planted as to be subservient to the action of one draw-stop, are called stops. A stop consisting of one row of pipes is called simple, of more than one compound.

The pipes are of four kinds, stopped, half stopped, (with a funnel or chimney at the top,) open and reed pipes. Various materials have been used for their construction, but the most common practice is to make the stopped pipes of wood, and the open and reed pipes of a metal composed of tin and lead.

Plate I. figs. 1. and 2. represent the front and section of a stopped wooden pipe. In *fig. 2.* *a* is a square block of wood, corresponding with the interior diameters of the pipe, upon which the back and two sides are glued. In this a channel is cut, in the direction of the shaded line, for the passage of the wind, which entering at the foot *d*, passes through the channel in the block, and the cavity of the lip or top piece *b*, and strikes upon the sharp edge of the front at *e*, the mouth; *c* is a moveable wooden stopper, covered with leather to make it air-tight. When this is drawn outwards, the tone of the pipe is flattened, and when pushed inwards, sharpened.

Figs. 3. and 4. represent the front and section of an open metal pipe. *Fig. 4.* *d* is the foot, which is a hollow cone, and is separated from the cylindrical body of the pipe *e*, by a partition called the tongue, or tongue, *a*, which answers the purpose of the block in the wooden pipe. The wind passes through a narrow aperture at *b*, and strikes upon the upper side of the mouth at *e*. A small ear is usually affixed on each side of the mouth, for the purposes of enriching the tone, and to tune such pipes as stand in the ornamental front of the organ. Metal open pipes are tuned by opening the tops with a brass cone, to sharpen them; and by closing them with the inside of the cone, to flatten them.

Figs. 5. and 6. are the front and section of an half stopped pipe, or pipe "à la cheminée." These pipes are tuned by opening or closing the ears, which are made very large for this purpose.

Fig. 7. is the exterior of a reed pipe, consisting of two parts, the foot, *a*, and the tube or body of the pipe, *b*. The tube is folded to a block of metal, *c*, (*figs. 8. and 9.*) which exactly fits into the upper end of the foot. In this is fixed a hollow demi-cylinder, *d*, of brass, called the reed,

reed, stopped at the lower extremity, and communicating at the other with the body of the pipe. The open side of the reed, (the edges of which are filed perfectly flat and parallel,) is covered with a thin plate of hard brass, called the tongue; one end of which is kept in its position by a small wooden wedge *f*, and the other left at liberty to vibrate with the action of the wind. The degree of acuteness, or gravity of a reed pipe, depends jointly on the length of the tongue, and that of the pipe; measured from the extremity of the reed to the extremity of the tube. It is, therefore, necessary to have some method of altering the length of the reed, in order to tune the pipe. This is effected by pulling up, or pushing down, the wire-spring *g*; which pressing the tongue closely against the reed, shortens or lengthens the vibrating portion of it. The degree of gravity, or acuteness of any pipe, depends upon the length; measured in an open pipe, from the edge of the mouth to the extremity of the tube; and in a stopped pipe, from the edge of the mouth to the interior surface of the stoppion. A stopped pipe is half the length of an open pipe of the same pitch.

The following list contains the names of the stops which are commonly used by English builders.

Stopped Pipes.—The bourdon, or double-stopped diapason, the stopped diapason, and stopped flute.

Open Pipes.—The prestant, or double open diapason, the open diapason, dulciana, principal, open flute, twelfth, fifteenth, tierce or seventeenth, larigot or nineteenth, and twenty-second.

Reed Pipes.—The trumpet, clarion, bassoon, hautboy, French horn, cremona, and vox humana.

Compound stops, usually consisting of open pipes, are the cornet, sesquialtera, furniture, mixture and supplement.

The organ has from one set of keys, in chamber organs, to four or five sets, in the largest church organs. Each of these sets of keys acts upon a separate organ, which has nothing in common with the others, except the case and bellows.

The number of keys, or compass of the organ in the time of father Schmidt, was commonly confined to four octaves; from double C in the bass, to *c* in alt. To these, two notes, G G and A A, were sometimes added to the lowest octave. An organ of this compass is said to have short octaves. When the keys are extended to G G in regular succession, the organ is said to have long compass. The modern builders have extended the keys upwards to *f* in alt^{mo}.

Besides the manuals or keys for the hand, there are, in large church organs, pedals, or keys played with the feet; said to be the invention of Bernard, a German, about the year 1400. These command certain pipes, which, to increase the harmony, are tuned an octave below the diapason. It is much to be lamented, that the English builders have not followed some certain and invariable rule for the position of their pedals, as they do for their keys. Scarcely two organs in the kingdom have their pedals alike; either with respect to number or position; so that every performer who comes to an organ, with which he is not previously acquainted (be he ever so skilful in the use of pedals), has the whole of his business to learn again. The disposition of the pedals of the fine organ in St. Paul's cathedral, might serve as a model for all other English organs. Each octave of the pedals occupies the space of two octaves of the finger-keys; and the C's are placed under each other, as represented in

Plate I. fig. 13.

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Plate II. represents the interior of an English church organ, seen in profile. It has three rows of keys. The upper row is appropriated to the swell, the middle to the great or chorus organ, and the lower to the choir or soft organ. The swell is said to be an English invention, and Dr. Burney, in his Tour through Germany, says that he found only one organ in which a swell had been attempted, and that in a very imperfect manner. The swell has its pipes inclosed in a stout wooden box, with a sliding door; which being gradually opened by the pressure of the performer's foot, the sound is increased, and is diminished by a contrary motion. The swelling organ is commonly placed in the upper part of the case, either over the great organ, or over the choir, as represented in the plate.

The great organ is commonly placed in the fore part of the case, for the convenience of planting the largest pipes in the ornamental front; and that it may appear louder.

The choir organ is sometimes placed in the position drawn in the plate; and sometimes in front of the great organ, in a separate case, at the back of the player. Hence it is not unfrequently called the chair organ.

The key movement of the choir organ, as represented in the plate, is of that kind called the *long* movement; because it may be extended to an almost indefinite length. It was used for the organ at the commemoration of Handel in Westminster Abbey; when the keys were 23 feet from the organ; and 19 feet below the level of the common key frames. The construction must be obvious to any one who has observed the common method of hanging bells. The trackers in the organ are of wood, instead of wire.

The organ at Haarlem, the most celebrated instrument in Europe, has been already described, from an actual survey. (See HAERLEM.) But the list of the stops we reserved for the general article organ.

Catalogue of the Stops in the great Organ at Haarlem, built by Müller, 1738.

Great Manual.

No. Names.	Length of longest Pipe.	English Equivalents.
1. <i>Prestant</i> ,	16 feet.	Open double diapason.
2. <i>Bourdon</i> ,	16	Stopt ditto.
3. <i>Octave</i> ,	8	Open diap.
4. <i>Viol da Gamba</i> ,	8 { A narrow pipe which imitates the whistling of the bow.	Unison with ditto.
5. <i>Roor Fluit</i> ,	8 { With a funnel, or small pipe, upon the top.	Diap. half stopt.
6. <i>Octave</i> ,	4	Principal.
7. <i>Gem's Hoorin</i> ,	4 { A kind of flute, the pipes narrow at the top.	Unison with ditto.
8. <i>Roor-Quint</i> ,	6	Twelfth half stopt.
9. <i>Quint</i> ,	3	Fifth.
10. <i>Tertian</i> ,	2 ranks.	Tierce or 17th.
11. <i>Mixture</i> , 6, 8, and 10 ranks.		Furniture, or mixture.
12. <i>Wood Fluit</i> ,	2 feet. { Stopt pipe, unison with the } Fifteenth, or octave flute.	
13. <i>Trumpet</i> ,	16 {	Reed stops. { Double trumpet. Trumpet. Clarion. Hautbois.
14. <i>Trumpet</i> ,	9 {	
15. <i>Trumpet</i> ,	4 {	
16. <i>Hautbois</i> ,	8 }	

3 X

Upper

ORGAN.

Upper Manual.

No. Names.	Length.	English Names.
1. <i>Prestant</i> ,	8 feet.	Open diapason.
2. <i>Quintadecna</i> ,	16 { Breaks into a 5th, } which predominates.	Double diap.
3. <i>Gen's-Hoorn</i> ,	8	Unif. with stopt diap.
4. <i>Baar pyp</i> .	{ A muffled pipe used } with the <i>vox hu-</i> <i>mana</i> .	Bear pipe.
5. <i>Octave</i> ,	4	Principal.
6. <i>Flag Fluit</i> ,	4 Reed-flute.	Flute.
7. <i>Nassut</i> ,	3	Stopt twelfth.
8. <i>Nagt-Hoorn</i> ,	2 { <i>Night-horn</i> ; but why } so called, no reason can be given.	Flute.
9. <i>Flageolet</i> ,	1½	Octave twelfth.
10. <i>Sesquialter</i> ,	2 ranks { Tuned octave } and 12th to the diap.	Sesquialter.
11. <i>Cimbaal</i> ,	3 ranks.	Octave to mixture.
12. <i>Mixture</i> , 4 and 6 ranks.	{ A series of eight } notes repeated thro' the instrument.	Mixture.
13. <i>Schalmay</i> ,	8 Reed stop.	Bagpipe.
14. <i>Dulcian</i> ,	8 { A narrow delicate } pipe, unison with the diap.	Dulcian.
15. <i>Vox humana</i> ,	8 An imitation of the	human voice.

Positif, or small Organ.

Lowest Set of Keys.

No. Names.	Length.	English Names.
1. <i>Prestant</i> ,	8 feet.	Open diapason.
2. <i>Holstuit</i> ,	8	Diap. half stopt.
3. <i>Quintadecna</i> ,	8	Ditto.
4. <i>Octave</i> ,	4	Principal.
5. <i>Flute</i> ,	4	Flute.
6. <i>Speel Fluit</i> ,	3	Twelfth.
7. <i>Sesquialter</i> , 2, 3, and 4 ranks.		
8. <i>Super-Octave</i> ,	2 feet.	Fifteenth.
9. <i>Scherp</i> ,	6 and 8 ranks.	High mixture.
10. <i>Cornet</i> ,	4 ranks.	
11. <i>Cimbaal</i> ,	3 ranks.	Octave mixture.
12. <i>Fagotte</i> ,	16 feet.	Double bassoon.
13. <i>Trumpet</i> ,	8	
14. <i>Regaal</i> ,	8 { Formerly a portable } organ used in procef- sions, was called a <i>regal</i> ; the stop in this organ is entirely composed of reeds.	Regal.

Pedals.

No. Names.	Length.	English Names.
1. <i>Principal</i> , longest pipe 32 feet.		{ Octave below the double } diapason.
2. <i>Prestant</i> ,	16	Double diap. open.
3. <i>Subbas</i> ,	16	Ditto, stopt.
4. <i>Roer Quint</i> ,	12	{ Fourth below the diap. } stopt.
5. <i>Holstuit</i> ,	8;	Diap. half stopt.
6. <i>Octave</i> ,	8	Open diap.
7. <i>Quint-Prestant</i> ,	6	Fifth.
8. <i>Octave</i> ,	4	Principal.
9. <i>Ruisch-Quint</i> ,	3 rush or reed	Twelfth.
10. <i>Holstuit</i> ,	2	Fifteenth.
11. <i>Bazuin</i> ,	32 { By the Germans } called <i>Poßaune</i> , a reed stop.	Double Sacbut.
12. <i>Bazuin</i> ,	16	Sacbut.
13. <i>Trumpet</i> ,	8	Trumpet.
14. <i>Trumpet</i> ,	4	Clarion.
15. <i>Cink</i> ,	2 { A cornet, horn, or } shawm,	Octave Clarion.

This organ has 60 stops, two tremulants, two couplings, or springs of communication, four separations or valves to close the wind chest of a whole set of keys, in case of a *cipher*, and 12 pair of bellows.

Upon the whole, it is a noble instrument, though we think that of the New church at Hamburg is larger, and that of the Old Kerk, in Amsterdam, better toned; but all these enormous machines seem loaded with useless stops, or such as only contribute to augment noise, and to stiffen the touch.

As this organ contains many stops, which are altogether unknown to English builders, and not to be found in the organs of this kingdom, we have subjoined a list of the stops of the organ at Great Yarmouth, as this noble instrument contains nearly all the variety of stops with which our workmen are acquainted.

Great Organ.

Cornet.
Clarion.
Trumpet.
Trumpet.
Furniture, 3 ranks.
Sesquialtera, 5 ranks.
Tierce.
Fifteenth.
Twelfth.
Principal.
Open Diapason.
Open Diapason.
Stop Diapason.
Double Diapason.

Choir Organ.

Vox Humana.
Vox Humana.
Mixture, 2 ranks.
Stop Flute.
Principal.
Open Diapason.
Stop Diapason.
Double Diapason.

Swell Organ.

Clarion.
Trumpet.
French Horn.
Cornet.
Principal.
Open Diapason.
Stop Diapason.

The organ was built by Jordan, Bridge, and Byfield, in the year 1740, though roughly repaired, and some stops added, by Mr. G. P. England, in 1812.

Compass of the great and choir organs from G G, to f in altissimo; of the swell from C below middle, to f in altissimo. Pedals from G G G, to C C.

Those who wish to be further informed in the history and practice of organ building, are referred to L'Harmonie Universelle, folio, Paris, 1636; Harmonicorum Libri Duodecimi, folio, Paris, 1648; Facteur d'Orgues, Paris, 1766; and Mr. Mason's Essays on English Church Music.

The organs in our churches, that have been well preserved of father Schmidt's make, such as St. Paul's, the Temple, St.

St. Mary's, Oxford, Trinity college, Cambridge, &c. are far superior in tone to any of more modern construction; but the mechanism has been improved during the last century, by Byfield, Snetzler, Green, Gray, &c. The touch is lighter, the compass extended, and the reed-work admirable. The dulciana stop, brought hither by Snetzler, is a tall, delicate, narrow pipe, of an exquisite sweet tone, without a reed; on which account it stands in tune equally well with the open diapason. Though the best keyed-instruments in England have been made by Germans, they work here better than in their own country in size and number of stops; they greatly surpass us in the size of their organs, but the mechanism is infinitely inferior; which is accounted for by the workmanship being better paid here than in the German dominions, where labour is cheap.

The long keys of our old church organs were made of box or ebony, and the short, or flats and sharps, of ivory. But at present, the long keys, or natural notes, like those in harpsichords and piano-fortes, are of ivory, and the flats and sharps of ebony, or dyed pear-tree wood.

An organ, when complete for cathedrals, is of three-fold construction, and furnished with three sets of keys; one for what is called the great organ, and which is the middle set, a second (or lower set) for the choir organ, and a third (or upper set) for the swell. In the great organ, the principal stops are known by the following names; the two diapasons, the principal, the twelfth, the fifteenth, the sesquialtera, the mixture or furniture, the trumpet, the clarion, and the cornet. The choir organ usually contains the stop diapason, the dulciana, the principal, the flute, the bassoon, and the vox humana. The swell comprises the two diapasons, the principal, the hautboy, trumpet, and cornet. Besides this complete organ, there are other organs of smaller sizes and more limited powers, adapted to church, chapel, and chamber use. There is also the barrel, or chamber organ, which has the parts of other organs, with the addition of a cylinder, or barrel, revolving on pivots: on the circumference of this, by means of wires, pins, and staples, are set the tunes it is intended to perform. These pins and staples, by the revolution of the barrel, act upon the keys, and give admission to the wind from the bellows to the pipes. The barrel organ is frequently made portable, and so contrived, that the same action of the hand which turns the barrel supplies the wind, by giving motion to the bellows.

Of all musical instruments, the barrel organ is the most easy of performance, as it merely requires a regular motion given to it by a handle. On this account, it is an instrument of very general use; and the recent improvements of some English artists have rendered the barrel capable of producing an effect equal to the fingers of the first-rate performers. Barrels are now very generally added to chamber organs, operating on the same pipes as the finger-keys, though by a different set of keys; so that either barrel or finger-keys may be used independently of each other. Many barrel organs are constructed on an extremely small scale, motion being given to them by clock-work. The whole instrument is frequently concealed in some piece of furniture, and the clock, being previously wound up, is put in motion at pleasure, by discharging a trigger, producing a very agreeable effect to those unacquainted with the concealment.

In order further to explain the mechanism of an organ, we have procured sections of a most superb instrument of this kind, made by Messrs. Flight and Robson of London, for the earl of Kirkwall. As a finger organ, this instrument does not contain any thing new in principle; but the perfection of its workmanship is such, as to produce effects which the organ would never have been thought capable of

before this instrument was completed, and publicly exhibited to immense numbers of visitors, at Mr. Flight's house in St. Martin's Lane. The mechanism of the barrel part is extremely ingenious, containing many new movements, which are necessary to give this method of performance the same powers as a good organist has upon the finger-keys; in this, however, the inventor has succeeded to his wishes. *Plate III. Organ, figs. 1 and 2.* are two sections of the whole instrument, the first being taken across the length, shewing one of the finger-keys, with the manner of its communication with the valves and pipes situated in the upper part, and also a cross section of the barrel in its proper situation. *Fig. 2.* is a section taken on a plane perpendicular to the other, that is parallel to the front of the instrument, and through its centre; so that the barrel and all its appurtenances are removed, and only the detents, &c. of the finger-keys exhibited. We shall first describe those parts which are common to all organs, that the reader may better comprehend the variations and improvements of the present instrument. The bellows for supplying the air are placed beneath the instrument, near the floor at A B C in both figures; these throw a constant supply of air into the large chamber D, which serves as a regulator to receive it and equalize its pressure, for which purpose it is termed the reservoir: from this the air is conducted through the wind trunk E, to the wind chest F: from the top of this chest passages are conducted up to the various pipes situated at G, H, I, K, L, M. The passages are closed by valves within the chest at *k*, (*fig. 1.*) and a whole row of them may be seen in *fig. 2*: from these valves small wires, *l*, descend, and by levers, N, communicate, by the rods Q, with the finger-keys O, P: the extremity, P, (*fig. 1.*) of one of these being pressed down, elevates the front end of one of the levers N, and pulling the wire, *l*, at the other end, opens the valve *k*, and admitting air from the wind chest into the pipe above, it produces the sound proper for that key.

Having given our readers a general idea of the disposition of the parts, we shall proceed to a particular description of the construction of each. The bellows at A B C consist of a moving board *a b*, (*fig. 1.*) having valves in it shutting downwards, to take in the air; it is connected by leather, glued all round its edges, with a large board *c c*, which as it extends beneath the whole instrument, and is united with its frame, may be called its floor or bottom. The floor has holes through it covered by valves, shutting downwards. The chamber formed by the space between the floor and the moving board *a b*, is divided into two separate compartments by a vertical partition above *d*, extending from one board to the other: the board, *a b*, is jointed by hinges and leather to this partition at the point *d*, and when worked, vibrates on this joint as a centre, enlarging one chamber and diminishing the other; which operation, by the arrangement of the valves, throws a constant stream of air into the reservoir, D, of the bellows. Thus, suppose the end, *a*, of the board ascending, and the other, *b*, descending, then the valves in *b* will be open to take a supply of air into their chamber. The valves in *a* will be shut, and the air included in that chamber is forced up through the valves, in the middle board *c*, into the reservoir D, which is situated above it. Though we have only mentioned one pair of these double bellows, there are in reality three pair, all made exactly alike: they are denoted by the letters A, B, C, *fig. 2.* The middle bellows B, which are much wider than the other two, are intended to be worked by the foot of the performer, by means of a treadle, which comes out in front of the instrument, beneath the key-board, as denoted by the dotted lines *b*, *fig. 1.* The other two pair, A and C, are worked by the

same handle as the barrel: when it is used, this handle is applied to a spindle *w*, (*fig. 1.*) proceeding across the whole instrument, and communicating motion to the barrel by means of wheelwork we shall describe: on the other extremity of this spindle is a fly-wheel *x*, to regulate the movement, and a crank, which by a rod, *z*, communicates motion to one end of the bellows *C*, at the end *a*, *fig. 1.* There is also another crank at *z*, bent at right angles to the former: this crank communicates, by a horizontal rod, with a bent lever behind the instrument, which works the other pair of bellows at *A*, so that both pair, *A*, *C*, are in constant motion.

The reservoir, *D*, is the size of the whole floor of the organ, and is common to all the three pair of bellows: it consists of a large flat board, joined by folded leathers on all sides to the floor board, forming a large chamber for the reception of the air from the different bellows. The weight of this board, always resting upon the included air, causes a pressure of air, and affords a regular and equable supply to the pipes during any momentary intermission of the action of the bellows; nor can the pressure on the air ever exceed what is produced by the weight of the upper board, for if more air is thrown into it than passes off to the pipes, the top board rises; but when it gets to the height which is intended, a string, fastened to the top board, raises up a valve in the floor board, and suffers the air to escape, by returning into the bellows below. By this means the reservoir can never be in danger of bursting. A string is fastened to the top board of the reservoir, and passes over a small pulley *y*, (*fig. 1.*) fixed on the end of a light spindle which comes through the front of the instrument over the keys, and has a hand or index at *y*, pointing to marks upon a small dial plate, indicating the height to which the top has risen, and, consequently, the quantity of air in the reservoir, so that this index serves as a guide to the performer, to blow as much as is necessary to keep the reservoir full, but no more.

The wind chest, *F*, is now to be described: this is a shallow box, as the section shews, the whole size of the instrument, and suspended in the frame: the air is conveyed from the bellows up to it by the wind trunk *E E*, at the end of the instrument: the wind chest contains a number of valves *k*, which at times permit the exit of the air; they are made of slips of leather with three pieces of wood glued to them, and are kept shut by a small wire spring *w*, (*fig. 1.*) applied to each. The valves are opened by means of small wires, *b*, coming down from them, through the bottom of the wind chest, and connected, as before mentioned, with the levers *N*. When any one is opened, the air passes out of the wind chest into a horizontal groove, which is seen just over the valves marked *i, k*, (*fig. 1.*) and ascends through vertical passages into any of the pipes *G, H, I, K, L, M*, causing them to sound: the wires, *b*, are hooked to the valves at their upper ends, and at the lower are jointed to the levers *N*: these have their centres fixed in the rail *R*, which extends along the whole instrument. At the opposite end of these, small rods, *Q*, are jointed, which at the lower ends rest upon the extreme ends, *O*, of the finger-keys *O, P*. By this arrangement, when the end, *P*, of any key is pressed down, it raises the rod *Q*: this, by the lever *N*, draws down the wire *b*, thus opening the valve *k*, and by admitting air, causes the pipe or pipes belonging to that key to emit a sound.

It has been before mentioned, that each key has several pipes of different tones, but tuned to the same note. In the instrument before us, there are ten pipes to each key, so that there are ten systems of pipes; but as only a part of these is ever required to be sounded together, the stops or sliders are provided to shut off or open the passages from each valve to as many pipes as the piece of music requires. The

stops are situated at *e, f*, and *g*, in the boards placed over the wind chest; they are narrow rulers of mahogany (seen lengthwise in *fig. 2.*) sliding in passages, which they exactly fill, and through which all the vertical passages to the pipes are conducted. The stops have holes through them answering to these passages, and when these holes are over the passages, they are open to allow the air to pass through, but by drawing the slider endways a small distance, the spaces between the holes in the stop apply themselves over the passages, and shut them all up at once. Each stop or slider opens passages to a set of pipes, consisting of one pipe answering to each of the notes of the finger-keys: these pipes are gradually diminished in length and size, from the largest bass note to the smallest treble, as is shewn in the figures at *G, H, I, K, L, M*, in different rows, some of which contain only about half the number of pipes corresponding with the finger-keys, the remaining numbers being placed in other rows for want of room, and the upper board *ee*, called the sound board, on which the pipes are placed, has horizontal passages cut in it, to conduct the air from each valve to its respective pipe, when the same is not situated exactly over it, as indeed very few are; for the number of pipes is so great, as to occupy all the space on the sound board, they must therefore be placed as the room will admit.

In the same manner, it will be observed in *fig. 2*, that the finger-keys *O, O*, are placed close together in a small space, while the wires *l, l*, and the valves *k*, occupy the whole length of the instrument. To manage this, the levers, *N*, are not placed parallel, but diverging from each other, so that the ends, *Q*, are close together, but the opposite ends are a considerable distance asunder, and therefore come immediately beneath the valves: the wires are connected with these levers by nuts screwed upon them, and this admits of adjusting them, that the valves shall all be shut close by their springs, when the finger-keys are all in a line, and at their highest position ready to be pressed down.

It is seen in *fig. 1*, that each of the horizontal passages or grooves immediately above the valves *k*, have ten other passages rising up from it, and in these, as before-mentioned, the stops are situated. There are three sets of these stops, marked *e, f, g*, one above the other; but by drawing any of the three the same effect will be produced on the instrument, viz. shutting off or opening the row of pipes to which they belong. The three sets of sliders are for three different purposes; thus the lowest set is moved by handles, or drawers coming out in front of the instrument, close to the finger-keys, and they are drawn out to open the stops by hand; the middle set of sliders is moved by the foot of the performer; the upper set is actuated by the barrel, when the organ is used in that manner. The organ pipes are of two kinds, of metal and of wood; the wooden ones are a square trunk of deal wood *A B*, (*fig. 3.*) closed at one end by a moveable plug of wood *D*, and at the other by a piece of wood *E*, containing a crooked passage to bring air to the pipe, through the short tube *F*; *a* is a piece of oak board glued to the block *E*, called the cap, and hollowed out, to communicate with the crooked passage, through the block, leaving a small and very narrow crevice between the end of it and the edge of the block *E*, through which the air issues in one continued current; in its passage it is divided by the edge of one side, *B*, of the trunk, which is cut as sharp as possible for that purpose, and which is exactly in the same line with the orifice whence the air is emitted. The sound is produced by the vibration of the air which is contained in the trunk *A B*, and by increasing or diminishing the length of this trunk the tone is altered

altered at pleasure, to bring it to the proper note it is to perform when placed in the instrument. This alteration of the length is made by sliding the plug, D, up or down in the pipe.

A section of a metal pipe is shewn in *fig. 4*; it is nearly the same in operation as the wood pipe, though different in its construction. It is a cylindric tube, A B, formed of a mixture of lead and tin, cast in thin sheets and foldered up; it is open at one end and nearly closed at the other by a partition, E, of the same metal, called the languid, which is circular for about two-thirds round, and foldered into the end of the pipe; the other third is a straight edge, and made rather sharp on the angle. F is a conical pipe conveying the air to the pipe: the upper end of this conical pipe is bent to be parallel to the edge of the languid E, and thus forms a small cleft, similar to the mouth of the wooden pipe for the passage of the air. The lower end, B, of the cylindrical pipe is bent into the line of the cleft, to divide the current of air. The metal pipes are open at top, and are brought to tune by enlarging or diminishing the pipe at the top, and thus altering its bulk; *a* is a piece of metal, called the ear, foldered upon the pipe at each end of the cleft, to prevent the stream of air being dispersed sideways, before it meets the edge or upper lip of the pipe. In the small pipes this is not applied, and in the wood pipes its place is supplied by the edge of the wood board forming the side of the pipe, which is not cut away.

There is another kind of organ pipes, which have a reed in the mouth; they are called trumpet stops. One of these is represented in section at *fig. 5*. Here A is a cylindrical tube, bringing the air up from the wind chest, and on the top of it a leaden ring or socket, B, is fitted. This is the support of the conical pipe, D, where the sound is produced. The air passes into the tube D, through a brass tube or reed *a*, which is stopped at the lower end, but has an opening down the front, where it is made flat. It is furnished with a tongue, or slender brass spring *b*, which applies to this flat side and covers the opening. When the wind is impelled into the pipe A, it enters through the reed, and puts the tongue into a vibratory motion, which gives the peculiar tone of this pipe. The tongue is held in its place, against the reed, by a small wedge thrust in by the side of it, and a wire spring *dd*, which presses the tongue against the reed, determines the length of the tongue, which shall have liberty of free vibration; consequently, by sliding this wire up or down, the pipe is brought to tune.

The trumpet stop is the most powerful in the instrument, and improves the tone as much as it increases the peal of the chorus. Being tuned in unison with the diapasons, it strengthens the foundation, and subdues the dissonances of the thirds and fifths of the sesquialtera, imparting to the compound a richness and grandeur of effect, adequate to the sublimest subjects.

The names of the stops or systems of pipes used in this organ are as follows:

Twelfth, a metallic stop, so denominated from its being tuned twelve notes above the open diapason, which will be mentioned hereafter. This stop, on account of its pitch or tuning, can never properly be used alone. The open diapason, stop diapason, principal, and fifteenth, are the best qualified to accommodate it to the ear.

Stop diapason, a stop, the pipes of which are generally made of wood, and its base, up to middle C, always of wood. They are only half as long as those of the open diapason, and are stopped at the upper end with wooden stoppers or plugs, which render the tone more soft and mellow than that of the open diapason. As the pipes of

this stop are of large size, they cannot be contained in one row on the sound board, they are therefore disposed in two rows, and have two sliders, one for the bass the other for the treble.

Open diapason, a metallic stop, which commands the whole scale of the organ, and which is so called in contradistinction to the stop diapason, the pipes of which are closed at the top; this has also two sliders for bass and treble.

Principal, a metallic stop, originally distinguished by that name, because holding, in point of pitch, the middle station between the diapason and fifteenth. It forms the standard for turning the other stops. It has two sliders.

Dulciana, a stop generally used in the choir organ. It possesses a peculiar sweetness of tone, which it chiefly derives from the bodies of its pipes, being longer and smaller than those of other stops. It is tuned in unison with the diapason, and equals them in compass upward.

Fifteenth, a stop which derives its name from its pitch or scale, being fifteen notes higher than that of the diapason. This stop and the twelfth, mellowed and embodied by the two diapasons and principal, form a proper compound for accompanying choral parts in common choirs and parochial churches. It is divided into two rows on the sound board for bass and treble.

The sliders which bring these different stops into action are moved by the following means: the lower set, Q, is drawn by levers at the ends of the instrument, which are formed on the upper ends of upright spindles *o, o*, (*fig. 2.*) turning on pivots supported by the frame: to the lower ends of these, long levers *p*, (*fig. 2.*) are fixed; and at the end of these, small rods are jointed, which come through the front of the case of the instrument, close to the finger-keys, and have small ivory knobs fixed upon them. These are marked with the names of the stops of pipes to which they belong, and any one being thrust in moves its slider, and opens the stops of pipes, which will then be sounded by pressing the finger-keys. There are ten of these handles, *viz.* five on each side of the finger-keys, though only two on each side are shewn in the figure, to avoid confusion: there being ten handles one is given to each of the sliders in the lower set, as shewn in *fig. 1*, and their names and properties have before been mentioned. The middle set of sliders, *f*, is drawn by bent levers, as shewn in *fig. 2.* at *r*: from the horizontal arm of this lever a wire proceeds to connect it with a pedal beneath the instrument, by which the slider is moved: these pedals are used in quick music, to change the pipes upon which the keys operate, by drawing another slider. There are only two of these pedals, but they operate upon all the ten sliders: thus, the bent levers, *r*, are fixed upon horizontal axes, which carry several levers, to operate upon as many sliders at once as are required. The pedals are for the left foot, one being longer than the other, so that the heel acts upon it, leaving the toes for the other: the first of these pedals shuts up the twelfth, both the fifteenth, and both the principals; the other pedal commands the remainder of the stops, except the dulciana. The finger-keys, O, P, are all together fitted in a kind of frame or box, which slides in a groove: in *fig. 1* they are represented as drawn out to the full extent, but admit of being thrust back out of the way to make no projection in front of the instrument. When drawn out as far as they will come, the end, *o*, of each key comes immediately beneath the end of each of the rods Q, which are retained in their positions by passing through holes in a fixed rail extended across the keys. The parts of the organ being now so fully explained, it is needless to say much of their mode of action. The wind chest and reservoirs are kept constantly full of air by the bellows, and

in this state any key being pressed down admits the air to the pipes. The stops which the performer expects to want are opened first; but by the pedals, as before mentioned, he can bring on or take off any others during the performance. There is also another pedal which actuates the swell; this is a number of valves or boards, fitted in the manner of Venetian blinds, and situated at 38, 38, (*fig. 1.*) forming the front of the close case or chest which encloses the pipes. These valves, being gradually opened by the pressure of the foot, give the power of increasing the sound, as the wind does the sound of a peal of bells, or suppressing it in like manner, by closing them up. The swell is situated immediately behind the ornamental front of the instrument, which is in part only thin silk, stretched in a frame to admit the passage of the sound. Each of the boards turns on pivots at its ends, and having short levers, which are connected together by a rod 39, they all open or shut together. At the lower end of the rod is a spring to shut them close, and they are opened by a lever 40 within-side, from which a wire descends to the treadle before-mentioned. The swell produced a most delightful effect in some music, giving the piano and forte to the organ, in a greater perfection than any other instrument admits of, not even excepting the violin.

The mechanism of the barrel comes now to be described, for we have hitherto spoken only of the finger-key. The section (*fig. 1.*) shews that there are two rows of valves in the wind chest. The use of the first set at *k* has been fully explained as belonging to the finger-keys; the second set, marked *i*, are opened by the keys, *b*, of the barrel *S*; they admit the air from the wind chest into the same passages as the other valves, and therefore sound the same pipes when opened: the valves are, like the others, closed by small springs, and have wires, *m*, coming down through the bottom of the wind chest, and united to the short keys *b*. These and the other parts are more particularly explained by the enlarged view of the barrel at *figs. 6, 7, and 8.* of *Plate IV.*, where it is shewn detached from the organ, with all its mechanism in perspective; but as the parts would intercept each other, if placed in their proper situations, *figs. 7 and 8* are represented as removed from the end of the barrel, though in reality these parts all come close to the end of it. This is explained by *figs. 10 and 11*, the former being an end view of the barrel and all its parts, and *fig. 11.* an elevation in front shewing its whole length.

The keys, *b*, are in miniature, the same as the levers at *N*, (*fig. 1.*), but their opposite ends are operated upon by pins projecting from the circumference of the barrel *S*, having backs, as the figures shew, upon which the pins operate in passing beneath them, to lift up the points of the keys: the pins in the barrel are so disposed as to lift the keys in the same order and time, as any piece of music for which the barrel has been previously made. The keys all turn upon one wire as a centre of motion, which is supported by a wooden rail *T*, extended across the instrument. To prevent the keys shifting sideways, and by that means missing the pins in the barrel intended for them, they move in small notches cut by a saw in a piece of brass plate, which is screwed to the front edge of the piece of wood *T*, and projecting beneath it: the wire, which forms the centre for the keys, is also fixed to the piece of wood *T*, which is called the key frame; it is supported at its ends on centre points, on which it rises and falls as a centre of motion, to lift the points of the keys clear above the pins of the barrel. These centre points are made in plates of brass at *n*, screwed to the ends of the frame, and projecting so as to bring the centre of motion to coincide with the joints at the ends of the keys *b*, with the wires, *m*, proceeding to the valves *i*, (*fig. 1.*) These brass plates carry projecting arms 1, which

have screws tapped through the extremities, and the points of these coming in contact with fixed studs projecting from the frame, form reils for the key frame; but by turning these screws the distance of the points of the keys from the barrel can be regulated at pleasure, that the keys may be properly lifted by the pins of the barrel.

The barrel is put in motion by a handle *w*, applied to the spindle *w*, (*fig. 1.*) before-mentioned, and shewn in *Pl. II.* at *fig. 6*: this has an endless screw, 2, formed upon it, which acts in the teeth of a small wheel, which is fixed on an axis, 3, parallel to the barrel, and proceeding towards its end, where it carries a broad pinion, 4, engaging the teeth of a large wheel, 5, fixed on the extremity of the barrel. By this means the same movement which, as before mentioned, blows the bellows, by the crank *x*, (*fig. 1.*) causes the barrel to revolve slowly. The manner in which the barrel is made to play a variety of different tunes in succession is thus: the spaces between the keys *b*, as shewn in *figs. 6 and 11.* are sufficiently wide to have eight rows of pins disposed in them, therefore only one-eighth of the circles of pins are at once engaged with the keys, and by moving the barrel lengthways a small quantity, an entire new system of pins are presented to the keys, and these are arranged to produce a different tune.

The barrel is supported on a frame of wood, which is represented detached in *fig. 6*; its position in *figs. 1 and 2* is denoted by *s*; it slides in grooves, so as to be capable of being drawn out, for the purpose of changing the barrel, and putting in a different one, but when slid back to its proper position is retained by two bolts. The pivots of the barrel rest in frames, 6, of brass at each end, which are attached to the woodwork by centres, on which they move sideways. A lever, 7, (*fig. 6.*) proceeds from each frame, and these are united by a wooden rail behind the barrel, which therefore causes the two frames to have the same movement on their centre, and carry the barrel forwards in the line of its axis, when at liberty. When in use it is confined by pieces of iron, 8, 9, moving horizontally on hinges fixed to the frame work, and pressing on the ends of the pivots of the barrel. The piece 9 is pressed by a spring behind it; the other piece, 8, at the opposite end of the barrel, is supported against the circumference of a wheel 10, (*fig. 7.*) which is formed like a snail, by continual variations of its radius. On the same spindle with this snail-wheel is another wheel, 11, divided on its edge with eight large notches, into which a roller at the extremity of a detent, 12, adapts itself: the detent being pushed down by a stiff spring, always obliges the wheel, 11, to rest in one of the eight positions corresponding to the eight notches for the roller, and every one of these positions produces a change in the situation of the barrel, because of the different radii of the snail 10, which permits the piece of iron, 8, to move; the spring piece, 9, at the opposite end always keeping the end of the barrel pivot in close contact with it: therefore, by turning the wheel, 11, round, the barrel is shifted a small quantity every time a different notch of the wheel, 11, comes to rest beneath the roller 12, and thus all its different tunes are played in succession. The wheel, 11, is turned about by means of eight pins projecting from its surface, one answering to each notch; these are pressed down by a catch 13, joined to a short lever 14, projecting from an axis 7, which also carries two other levers, marked 15 and 16; the former of these has at the upper end a wire, 15, coming through the frame of the organ, and furnished with a knob, by pulling which the lever, 14, is depressed, and the catch, 13, turning the wheel, 11, round one notch, shifts the tune of the barrel, as before explained. But without some contrivance to raise up the key-frame, *T*, when the barrel is shifted, its pins might catch some of the points of the keys, and break or bend

bend them sideways. To avoid this danger, the same lever, 15, which communicates motion to the wheel to shift the barrel, has a detent, 17, jointed to it at one end; it passes through the frame of the organ resting upon a roller 18; the extremity of it is situated beneath a small roller 19, which is attached to the front plate of the key-frame at its end: the operation of this is, that when the knob, 15, is drawn forwards to shift the barrel, the detent, 17, also advances, and an inclined or thicker part coming upon the roller 18, causes the end, 19, to rise up, and lift the key frame T, (*fig. 8.*) so high, that the pins in the barrel will clear the keys before the barrel has began to move endways, by the shifting of the snail-wheel 10. The shift having been made, the knob, 15, is let go, and the return of the levers to their first position, by springs on purpose, permits the key-frame to descend, and all is ready for the next tune, which commences as soon as the barrel is turned round. To prevent the key-frame descending with a jerk, which might do it injury, a small lever, 20, (*fig. 8.*) projects from it at one end, and has a wire proceeding upwards to a small pair of bellows, 21, fixed up beneath the wind chest; they have no opening into them, except a hole through the top board, which is covered by a valve, shutting downwards, to permit the escape, but prevent the re-entrance of the air. The operation of this is, that when the key-frame is lifted up for the purpose of shifting the barrel, the bellows close, and the air included in them passes out beneath the upper valve; but on the frame being suffered to descend, the air cannot speedily obtain admission into the bellows, as there is no other passage than from leakage, and this regulates its fall. Besides these provisions for shifting the barrel, the pinion, 4, (*fig. 8.*) is likewise detached from the wheel at the moment of its shifting, that it may have no impediment to its motion from friction. To explain this, we must observe that the pivot of the spindle, 3, is supported by a crooked lever, 22, (*fig. 10.*) moving on a fulcrum in the framing; the opposite end being pressed down by a spring 23, fixed on the top of the frame s, always keeps the teeth of the pinion, 4, and wheel, 5, in close contact with each other. The lever 1, attached to the key-frame, has a rod, 24, descending from it to connect with a second lever, 25: this carries a rod, which is forked at the lower end, and embraces the pivot of the spindle 4. By this means, when the key-frame is lifted up, as before described, the lever, 1, is depressed, which, by the rod 25, forces down the end of the spindle 4, and disengages the pinion from the barrel; but the moment the key-frame descends, the spring 23, at the end of the lever 22, presses up the wheels into gear with each other. That the shifting of the tune may be done by a pedal for the foot, as well as by pulling the knob 15, there is a rod descending from the end of the lever, 16, to the bottom of the instrument, where it is connected with a pedal; therefore, by depressing this, the same effect is produced as would be by drawing out the knob 15.

A great improvement in this organ is the circumstance of the barrel being made to operate upon the stops, as well as the keys, by which means it performs any full piece of music with the finest effect. The mechanism by which the motion is given to the stops is very ingenious, and requires particular figures for its description. The upper set of sliders *e*, (*figs. 1 and 2. Pl. I.*) are appropriated solely for the barrel; they are moved at the left-hand end (*fig. 2.*) by being attached to vertical levers W; the lower ends of these are connected by light wooden rods, X, X, extending beneath the wind chest, to small levers *t*, (*fig. 1.*); these are affixed to short spindles, whose situation is marked by *v*, in *fig. 1.* Now it is evident, by that partially turning the spindle *v*, the lever, *t*, will draw the connecting rod X, and by the lever, W, actuate the

slider, *e*, of the stop. The figure also shews that the extremities of the spindles, *v*, are immediately over the extremities of the keys *b*. It is in the connection between these that the ingenious contrivance is shewn. *Fig. 9* is a small detent or three-armed lever, in shape of the letter T, called the tumbler, fixed on the projecting extremity of the spindle *v*; from each of its two arms, 26, 27, a pin projects: 28, (*figs. 12 and 13.*) is a detent of brass, connected at its lower end with the end of one of the keys *b*, (*fig. 6.*) and therefore descends when the opposite extremity of the key is lifted up by the pins of the barrel. This detent has two hooks at its upper end, which can be occasionally brought to engage either of the two pins projecting from the two arms, 26 and 27, of the tumbler; but as these two are on opposite sides of the centre of motion *v*, it is evident that, by being hooked on one, it will, when depressed by the key, turn the spindle, *v*, one way, and shut the stop, but being hooked on the other pin, the same motion of the key will produce an opposite effect on the spindle, and open the stop. The detent is made to shift itself every time it is acted upon in this manner: the upright arm, 29, of the tumbler has a projecting claw, which is cleft for the reception of a light spring, 30, affixed to the lower part of the detent 28, and when at liberty standing straight in the direction of its length. Now suppose the parts in the position of *fig. 13*, the hook of the detent is over the pin, 27, of the tumbler: in this state, if the detent is drawn down by the key, it depresses the arm 27, and throws the arm, 29, over to the opposite side, as shewn in *fig. 12*, carrying the end of the spring, 30, with it, and bending it. Now the instant the pressure of the key is relieved, the spring throws the detent over to the other arm, 26, of the tumbler, and it is ready the next time it is acted upon by the key, to return the stop to its original position.

As it is necessary, when the barrel commences a piece of music, that the whole number of stops should be open, the lever 40 (*figs. 8 and 10.*), is fixed on the spindle *q*, and has a rod, extending beneath the instrument to the right-hand end: there it operates upon a lever, situated on a horizontal spindle, carrying as many arms as there are stops. These, when the barrel is shifted by the knob 15, as before explained, push in the whole of the stops at once.

There are four stops or ranges of pipes, which are exclusively appropriated to the barrel, in addition to the ten stops which belong to the finger-keys. These are called the stop-diapason accompaniment, which are wooden pipes to be used in concert with the stop diapason; the flute stop, which consists of small wooden pipes; as are also the pipes of the flageolet stop; lastly, the trumpet stop, which consists of metal pipes with reeds, constructed as shewn at *fig. 5.*

Our readers will now have a good idea of the mode of action of the barrel. The key-frame, as shewn in *fig. 6*, contains 102 keys; 88 of them being connected with the valves in the wind chest, and the remaining 14 for the stops: these are all situated towards the left-hand end, because, as shewn in *fig. 2*, the wires for the valves are there at so great a distance asunder, as to admit the stop-keys to be placed in the spaces between the valve-keys. The barrel has 102 circles of pins in action at the same time, and eight times as many, *viz.* 816, upon its circumference, containing eight different tunes, as before described; any one of which can be played by shifting the snail-wheel 10. There is a small dial in front of the organ, with an index, which shews what tune the barrel is set for: it is on the opposite side to the wind-dial *y* (*fig. 1.*), and its motion is communicated from the wheel 11, by a lever and detent. On turning the handle *w*, the endless screw, 2, gives motion to the spindle 4, and that turns the barrel with a very regular motion, because of the fly-wheel *x* (*fig. 1.*)

As the pins in the barrel pass by the keys, they lift them up at the proper intervals of the tune; and many are made like staples, with a long shank, so as to hold a note, by keeping up the key for some time. All this time the stops are, by the tumblers (*figs. 12 and 13.*), as before mentioned, brought on and off to give all the variations, in a full piece of music, and introduce the different instruments which are imitated by the pipes of the several stops, giving the instrument the effect of a whole band of performers, and that with a precision of time and harmony seldom to be met with in a concert. The formation of these barrels (for the instrument has several different ones which can be put in) is a most delicate mechanical operation, and requires a good knowledge of music. Messrs. Flight have improved this branch of the art, by the introduction of mechanism for actuating the stops, and also by some mechanical contrivances, for dividing and setting out the barrels more accurately than they are usually done.

It will be evident that, on a barrel such as we have described, no piece of music of great length can be performed; because when the barrel has made its revolution, the same tune is repeated. But to give the instrument the power of performing very long pieces, spiral barrels are introduced: in these, the pins, instead of being arranged in 816 circles, are disposed in 102 spiral lines, each making eight turns upon the barrel, which, as it revolves on its axis, also traverses end-ways, thus bringing the spiral lines constantly beneath the keys; so that the barrel admits of making eight revolutions, before it repeats the same tune. It is evident that such a barrel cannot be shifted to produce different tunes, as in the former case, its circumference being wholly occupied by one piece, if it is very long; or it may be made to contain two, three, or four shorter pieces: but still they must follow in succession upon the same spiral lines, and will come after each other, in turning the barrel, without any shifting. When a spiral barrel is put into the instrument, the snail-wheel, 10, is detached from its spindle, as it can be of no use: instead of it, the arbor or pivot of the barrel has a screw or worm 34, (*fig. 14.*), fixed upon it; the interval of its threads corresponding in distance with the spiral lines upon the barrel; so that a fixed piece of steel, being held in the groove of the screw, will, when the barrel is turned round, cause it to traverse at the same time it revolves. This fixed piece of steel is attached to a projection of a piece of brass, 31, 32, 33, called the thumb-piece: it supports the spindle of the snail-wheels, 10 and 11, before described; but having no motion in the use of the plain barrel, was then considered as a fixed piece; it is in reality attached to the key-frame thus: it has an arm 32, (*fig. 7.*) proceeding from it, which at the extremities turn up into joints, 32, 32; these are received into similar joint pieces of brass, screwed to the key-frame T, so situated that the joints are exactly in the line of the centre of motion for the key-frame, so that the thumb-piece has liberty to rise and fall on the same centre of motion as the key-frame; but being attached to it by a long firm axis, 32, 32, it has no other motion than upon this centre. A wire 37, (*fig. 7.*) is jointed to the thumb-piece 31, and, passing through a hole in the key-frame, has a nut screwed upon it: this is so adjusted, that the key-frame may be lifted up a small quantity, without raising the thumb-piece; but after this, the nut lifts it up. By this means the key-frame will always be lifted up, to clear the points of the keys from the pins, before the edge, 33, quits the groove of the screw, and suffers the barrel to shift end-ways.

Suppose the barrel put into its place, and thrust towards the left hand, as far as it will go, the edge, 33, of the

thumb-piece is inserted into the groove of the screw, as shewn in *fig. 14*; the key-frame let down, and all is ready to begin, from the commencement of the piece of music. On turning the handle, the barrel revolves, and at the same time traverses, by the screw 34, till it has made eight turns, and come to the end of the piece; the end of the screw, 34, having come to the edge of the thumb-piece 33, the barrel must be returned to its first position, to repeat the music. It does this itself by the following means: a projecting pin, 35, is fixed in the right-hand end of the barrel, at such a distance from the centre, that it will intercept the end of a catch, 36, fixed to the key-frame; but it passes clear, by the side of this catch, at every revolution but the last, when the screw has traversed the barrel so far as to bring the pin, 35, into the plane of the catch 36. This happens at the moment the piece is finished; and as the barrel turns, it lifts up the key-frame, and raises the keys clear, ready for the barrel to return: the pinion, 4, is at the same time disengaged by the levers, 24, 25, as before described. The keys having risen sufficiently for this purpose, the wire, 37, lifts up the thumb-piece, so that its edge, 33, leaves the spiral groove of the screw, and nothing now prevents the return of the barrel by the action of the spring-piece 9, which always presses on the left-hand pivot. But as the key-frame would descend the instant the pin 35, in the end of the barrel, quits the catch 36, another catch, 38, at the other end, is introduced: this holds up the key-frame until the barrel has completed its return. The end of it then strikes the lower end of the catch: this suffers the key-frame to descend, and the edge, 33, of the thumb-piece enters the groove of the spiral at its commencement, ready to repeat the tune: the catch, 38, has a screw through the lower end, upon the head of which the barrel strikes; this admits of adjustment, so that the edge, 33, shall fall, when the groove of the screw is precisely beneath it.

We have been thus particular in our description of this superb instrument, not less on account of its mechanical ingenuity, than from the great celebrity it has obtained from the first professors of music, who have frequently borne testimony to its evident superiority over any thing of the kind before produced; and allowed that mechanism has, in this instance, become a most powerful rival of the best execution on finger-keys.

His royal highness the prince regent lately dined with lord Kirkwall, and a select party of nobility. During the desert they were entertained by the performance of the celebrated opera of Mozart's, the Zauberkunst, by the barrel part of this instrument, followed by the march, in the same piece. The machine produces the various accompaniments of a whole band of music, in such dulcet as well as forcible tones, that no one would credit without an opportunity of hearing it.

The inventor then played various pieces on the finger-keys, one peculiarly adapted to display the rich, mellow sounds of the bugle horn; then produced a similar imitation of French horns and bassoons, with echoes to each, which were exactly as if they replied from the opposite side of a river to the original notes sounded in the room. These magic effects are chiefly produced by the swell, which gives to the organ all the variation of softness or loudness, imitating at pleasure the sounds of violins, or bowed instruments, in the most striking manner, but rather by association than reality, because those are the instruments from which we are accustomed to hear the alternation from soft to powerful tones, in the greatest perfection.

The organs of which we have been speaking, however simple or complex as to their number of stops, or ranges of keys,

keys, &c. have but twelve finger-keys in each octave, and these are generally tuned to what is called the *mean-tone* system, that is, eight of the major thirds, *viz.* on C, G, D, A, E; F, b B, and b E, are made perfectly in tune, or very nearly so, and four of the thirds, *viz.* upon B, * F, * C, and * G, remain each, unavoidably, too sharp, by an enharmonic diesis (or near it), which some call a quarter of a tone, and consequently, such thirds *beat* very fast. The organ in the Temple church, London, has fourteen sounds, and as many finger-keys in each of its octaves; the performer has it therefore in his power to avoid or remedy the first of the above false thirds, by substituting * D, instead of b E, and the last of these (below C), in some cases, by the use of b A instead of * G. These substitutions the Temple organist is enabled to make during performance, owing to the short key between D and E being divided in its length, the longer or front half of it touching * D, and the shorter or back half sounding b E. In like manner the short key between G and A is divided, the front part for * G, and the back part for b A. This is, we believe, the largest number of finger-keys which remains in use in this, or perhaps any other country, although instruments have been made, and tried, with nineteen finger-keys in each octave, but playing upon them was found too difficult, if not impracticable. The Foundling Hospital organ, in London, has sixteen sounds in each of its octaves, but only twelve finger-keys, as usual, having quarter notes, as some call them, for * D, b A, * A, and b D, in addition to the twelve common notes as above; and which new notes, by means of two stops that move sideways, can be brought on when wanted, in order to correct all the four major thirds that are too sharp, as above mentioned: still, however, several other false concords occur in the use of this instrument.

The organ at Christchurch, in Blackfriars road, London, has been lately erected under Mr. Hawke's patent, a copy of which will be found in the *Philosophical Magazine*, vol. xxxvii. p. 323 and 325, see also vol. xxxix. p. 417. This has seventeen sounds in each octave, (see our article *HAWKE'S Temperament*,) yet has only the twelve usual finger-keys, seven of which are long ones, and five short ones; the latter producing the *sharp* notes, unless that a pedal is pressed, which flattens each of these notes a diesis, and makes them all *flat* notes.

The organ which Dr. Kemp exhibited in his lectures at the Ruffel Institution, for which Mr. Loefchman has a patent (see the *Philosophical Magazine*, vol. xxxvii. p. 326, and vol. xxxviii. p. 47.) has twenty-four sounds, and as many pipes in each octave. By the help of six pedals, and the twelve usual finger-keys, the performer is enabled to execute the mean-tone system correctly, or any other, in the twenty-four usual keys, and very nearly so for all the concords that occur in thirty-three different keys.

All these progressive steps in the improvement of the *tune* of organs, are only applicable to the tempered systems of tuning, in which the greater part of the concords must still be left imperfect, although the most improved systems have them so in *small*, and in equal degrees, instead of that great and disagreeable irregularity, which attends all the usual modes of tuning organs with only twelve notes; we say usual modes, because on the organ, an *equal temperament* has certainly never been used, whatever may have been done on piano-fortes, and other stringed instruments, where *beats* are less observable and offensive. In the year 1810, the Rev. Henry Lifton perfected an instrument, calculated to supersede temperament altogether, and took out a patent for the same, under the name of the *Euharmonic organ*; which patent will be found described in the *Philosophical Magazine*, vol. xxxvii. p. 328.) Since that period, Messrs. Flight and

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Robson have completed another organ for him (*Philosophical Magazine*, vol. xxxix. p. 373 and 414.), containing twenty-four pipes in each octave, and provided with eleven pedals, six of which, for flats and sharps, are used exactly similar to those of Mr. Loefchman above mentioned. This invention enables the performer to produce *perfect harmony* in every key which is in common use, as Mr. Lifton has fully explained mathematically, and by reference to numberless experiments and examples on his organ, in his "Essay on perfect Intonation," a work to which we wish to call the notice of composers as well as performers, as developing many of the hitherto hidden mysteries of harmony. It may be proper to add, that the twenty-four pipes of Mr. Lifton's organ, are occasionally made to yield twenty-four other notes, which are each one comma flatter than the pitch of the pipes, and also eleven other notes, which are each two commas flatter than certain of the pipes; making in all fifty-nine notes in each octave; all which degrees of sound frequently come into use, in the keys now commonly used on the organ; and in all the correct performances of violinists, fingers, &c. they have always been in use. These changes of the sounds of his pipes, Mr. Lifton effects by sliders, or flat plates of metal of two different sizes, which by means of his pedals are made to stand over the tops of open pipes, or before the mouths of stopped pipes, at the due distance for flattening the pipe the exact proper quantity, while it is so presented to the current of air issuing from the pipe. The tuning of these organs has no difficulties, except the labour of it, because not a single interval requires tempering, but the whole are produced from perfect concords, without the slowest perceptible *beating*, such intervals as a performer uses in tuning his violin.

In attempting to describe the requisites of a good organ, we shall begin with the bellows; which, besides being of a size fully adequate to supply the chorus, should at all times give an equal weight of wind. This may be known, by holding down two notes of the diapason, or any other stop, when the bellows are nearly full, and observing whether they continue in the same relative state of tune, until the bellows are nearly empty. If they do, the wind is equal; without which no organ can ever be in tune: also, when carefully blown, no difference should be heard from the action of blowing. In like manner, a single note of the diapason should continue unaltered in its pitch, and smooth in its tone, while the other stops are added in succession, until the whole chorus be drawn. This proves that the wind meets with no impediment in its course to the pipes; a requisite of no less importance than the former.

The draw-stops should move with sufficient ease and smoothness; and should stop so decidedly, as to leave no doubt of their being completely drawn, or shut.

The touch of the keys should be free and elastic, and exactly the same pressure should be requisite to put down every key throughout the scale. No better proof can be given of a good touch, than that a turned shake can be executed with equal facility in every part of the scale, except perhaps in the lowest octave, where it is not to be expected or desired. If all these things act without noise, the mechanical parts of the organ may be considered good, and in order.

The goodness of the pipes is not so easily described, because much depends upon the quality of the tone, of which little idea can be given in words. A fine quality and great strength can hardly be expected from the same pipe: it, therefore, depends somewhat on choice which to prefer; though it does not follow that all soft-toned pipes are of a fine quality. But be the quality what it may, it should be uniform from the top to the bottom; a requisite which cannot be too strongly insisted on in all instruments, so as to

give the idea of all the notes coming from the same pipe or string.

It is indispensable to an organ, that it have a good stopped diapason, as that stop is the foundation of the organ, and is never shut, except when the dulciana or flute are used as solo stops. It is of great importance that it be sufficiently full and bold in the base, particularly in those chamber organs which have an open diapason; as that stop is seldom extended lower than G gamut. And in large church organs, where the open diapason goes through the scale, the lower notes are feeble, if not supported by the stopped diapason; and it may be observed, that no stop should be loudest at the top. Of the open diapason, little more need be said than that it should be full, smooth, and articulate. In small organs it is entirely dispensed with; and in those which are larger, it is in the treble only, or more or less extended into the base, according to the size of the organ, or choice of the builder; and it may be proper to observe, it is better that the lowest pipes should not be so loud as to make the break very perceptible. In large church organs there are frequently two open diapasons through, and nothing can be a greater recommendation to an organ than its having good diapasons. What has been already said, will apply to all other stops generally, when taken singly; but their relative strength is of great importance to the goodness of the chorus. As a single stop should not be loudest at the top, so the chorus stops should not predominate over the diapasons; a fault very general in the old organs, arising from the bad taste of the times in which they were made. The chorus should be rich, brilliant, and articulate; and the twelfth and tierce, and their octaves, should not be heard, except when listened for. The trumpet-stop, when good, adds greatly to the majesty, as well as to the strength of the chorus; and its octave, the clarion, increases its brilliancy.

The goodness of these, and all other reed stops, besides the requisites already mentioned, depends upon their speaking readily and quickly; and being free from the nasal tone, such as is produced by bad players on the clarinet, or haut-boy. And it had been well if the trumpet had never been used as any other than a chorus-stop; for its use, as an imitation of a real trumpet, has given rise to the introduction of a variety of imitation-stops; most of them a disgrace to the noble instrument in which they are suffered to intrude; and its consequence, a trifling and vitiated style of performance, equally disgraceful to the taste of this country, where only it is cultivated.

ORGAN, *Hydraulic*, denotes a musical machine that plays by means of water instead of wind.

Of these there are several in Italy in the grottoes of vineyards.

Ctesibes of Alexandria, who lived in the reign of Ptolemy Euergetes, is said to have first invented organs that played by compressing the air with water, as is still practised. Archimedes and Vitruvius have left us descriptions of the hydraulic organ. Felibien, *de la Vie des Architectes*. See Hawkins's *History of Music*, vol. i. p. 190, &c. See HYDRAULICON.

In the cabinet of queen Christina is a beautiful and large medallion of Valentinian, on the reverse of which is seen one of these hydraulic organs; with two men, one on the right, the other on the left, seeming to pump the water which plays it, and to listen to its sound. It has only eight pipes placed on a round pedestal. The inscription is PLACIA SPETRI, if it be not wrong copied, which we suspect.

ORGANICAL, in the *Greek Music*, was synonymous with instrumental, or music played by instruments, which had a notation in characters different from the vocal, as may

be seen in Bacchius and Alypius. See *Greek Music*, and CHARACTERS.

ORGANICAL, or *Organic Diseases*, are those diseases in which the structure of some organ of the body is actually deranged, and its functions consequently impeded.

Disorder of function, however, does not necessarily imply derangement of structure: all diseases, therefore, are not organic. Diseased *action* of the vital and irritable parts will be attended with a disordered state of the functions, as well as diseased *structure* of the parts themselves; and it is extremely important to distinguish between these two sources of morbid symptoms. For the diseases, which arise from the former source, are generally within the ready controul of medicine; whilst those, which originate from morbid structure, are commonly beyond the reach of art; or at least palliation of the symptoms, and the retardation of the progress of the morbid condition, are all that art can effect, except in the early stage of structural change.

This statement may be illustrated by a view of the diseases of the stomach; some of which are the result of morbid action of the muscular coat, or of the secretory vessels, excited by irritation in the organ itself, or by sympathy with some other organ; and some arise from actual organic changes of structure in the substance of the viscus. Thus pain and sickness, amounting even to vomiting, may be excited, in a very irritable condition of the stomach, by the ordinary food, or by any substance which is acrid, or not easily digested: this irritability, again, may be occasioned by a particular state of the nervous system in general, or of that of the stomach in particular, or it may be merely sympathetic of a diseased condition of the brain, or of a calculus in the kidneys, &c. Under any of these circumstances, the disorder of the stomach is not organic; there is no derangement of its structure, nothing which the eye could detect, if it had access to the interior parts of the body; and the morbid action of the organ may be perfectly cured, either by diminishing the general or local excess of irritability, by appropriate medicines, or by curing the diseases of the brain, the kidney, &c., of which the state of the stomach is merely sympathetic. But, on the other hand, pain and sickness in that organ may be connected with a morbid change in its structure; as, for example, with a chronic inflammation of its coats, or with a scirrhus or cancerous state of the organ, especially about the pylorus, or passage into the bowels. Scirrhus or cancer of the stomach, as of other organs, is scarcely within the power of medicine, the object of which is, therefore, limited to an alleviation of the symptoms, by means of anodynes, light, liquid, and digestible diet, in small quantities, and laxatives.

Organic diseases are not always distinguishable, in their commencement, from mere disorders of function. They often proceed for a considerable time, without any great derangement of the functions themselves, and with intervals even of total freedom from any morbid symptoms; so that they are often only discovered to be organic, by the pertinacity with which they continue, until at length, not only the functions of the diseased organ are greatly impaired, but a hectic or habitual fever comes on, the strength sinks, and general emaciation evinces the failure of the functions of nutrition, which a fixed disease in any important organ ultimately produces.

It is only upon diseases that are organic, that dissection after death throws any light: and it has taught us to connect certain symptoms during life, with certain changes of structure in particular organs; inasmuch that a skilful observer will commonly be able, from marking the symptoms, to point out the organ diseased, and the nature of the morbid change that is going on. Hence the obvious value of *morbid anatomy*,

anatomy, as it has been called, to the physician. Nevertheless, it is to be lamented, that this value is of less practical importance than it seems to be at first sight : for the animal machine differs materially from all other mechanism, inasmuch as we have not the means of replacing the parts that are become useless or decayed, nor even of rectifying the derangement of structure, which we know has taken place, if it have already made any considerable progress. The principal practical advantage, derived from such knowledge, consists in the early detection of incipient organic disease, while its progress may yet be arrested, and in the prevention of all violent measures, in the later stages, when palliation is all that can be hoped for. For although much alleviation of pain and suffering is within the power of art, yet much injury may sometimes result from the fruitless administration of strong medicines.

The various organic diseases of the body, will be found described under their respective appellations.

ORGANICAL Description of curves is the method of describing them on a plane by means of instruments. See **CURVE**.

ORGANICAL Part, is that part of an animal or plant destined for the performance of some particular function. See **ORGAN**.

ORGANICAL Parts, in Buffon's system of generation. See **GENERATION**.

ORGANISER *le Chant*, in the beginning of counterpoint, was to introduce some thirds at the closes of a chant in unison : for example, when one part of the chorus sung C, D, B, C, the other sung at the same time C, D, D, C. It appears by these examples, cited by the abbé le Bœuf, and by others, that organisation was seldom practised except upon the sharp 7th, or note sensible at a close ; hence it follows, that it was always the minor third which constituted this new harmony. For a concord so easy, and affording so little variety, the fingers who organised had a particular remuneration. With regard to the *organum triplum*, or *quadruplum*, which was also simply called *triplum* or *quadruplum*, it was nothing else but the same chant with the parts organised with the counter-tenor in the octave to the base, and by the treble in the octave to the tenor.

ORGANNA, in *Geography*, a town of Spain, in the province of Catalonia ; 18 miles N. of Solsona.

ORGANO, in Corelli's concertos, and in general all concertos composed in Italy for the church, is the ripieno base appropriated to the organ.

ORGANZINE, in the *Silk Trade*. See **SILK**.

ORGAS, in *Geography*, a town of Spain, in New Castile ; 12 miles S.S.E. of Toledo.

ORGASM, *οργασμος*, denoting violence, or turgescency ; formed from *οργαν*, *turgeo*, *I swell*, an ecstasy or impetuous desire of coition, occasioned by a turgescency of the seminal vessels, which are no longer able to restrain their contents.

The ancients also extend orgasm to the other humours, and even excrements, which being accumulated, and coming to ferment, demand excretion.

Quincy uses orgasm for an impetuous or too quick motion of the blood, or spirits ; by which the muscles are distended with an uncommon force.

ORGE, L', in *Geography*, a river of France, which runs into the Seine, 30 miles S. of Paris.

ORGELET, a town of France, in the department of the Jura, and chief place of a canton, in the district of Lons-le-Saulnier ; 12 miles S. of it. The place contains 1224, and the canton 10,014 inhabitants, on a territory of 245 kilometres, in 40 communes. N. lat. 45° 31'. E. long. 5° 41'.

ORGERES, a town of France, in the department of the Eure and Loire, and chief place of a canton, in the district of Chateaudun ; 12 miles S.W. of Janville. The place contains 286, and the canton 6927 inhabitants, on a territory of 310 kilometres, in 18 communes.

ORGIA, a town of Etruria ; six miles S.W. of Sienna.

ORGIA, *οργια*, in *Antiquity*, feasts and sacrifices performed in honour of Bacchus, instituted by Orpheus, and chiefly celebrated on the mountains by wild, distracted women, called *Bacchæ*.

Eusebius derives the word *οπο της οργης*, *fury*, *madness*.

Others from *ορος*, *mountain* ; because Orpheus removed from Thrace to mount Citheron : others from *οργος*, a place consecrated to some divinity : others from *εργαν*, *to remove*, *to repulse* ; in regard the profane were to be driven away.

The orgia were also called Orphica, from their institutor ; and Bacchanalia, Dionysia, and Liberalia. It is a fact agreed upon by both mythologists and antiquaries, that the orgies derived their original from Egypt ; and that they owe their institution to Isis, who having recovered the dissipated members of her husband, murdered by the conspirators, headed by Typhon his brother, and being unable to find the virile parts, which the fishes of the Nile had devoured, consecrated the representation of them, which the priests in after times carried about in the festivals instituted in honour of that prince. It is also another allowed fact, that Orpheus and Melampus, in their travels to Egypt, had seen the festivals of Osiris celebrated, and introduced them into Greece. Bacchus, it is said, in honour of whom the orgies were celebrated, is the same with Osiris. From Greece the orgies passed into Phrygia ; and the knowledge of them was brought into Italy, either by the Arcadians, when they planted a colony in Latium, or by Æneas himself with his Trojans, who had previously celebrated this festival.

They were held every third year. The chief solemnities were in the night-time ; and were attended with all manner of impurities.

They were carried to such an excess, that in the year of Rome 568, the senate was obliged to abolish them through the whole empire. And Cicero informs us, that Diogenes abolished these infamous festivals at Thebes.

The women who presided over these feasts were called *Orgiastæ* : and the men who performed the same office were denominated *Orgiophantæ*.

Servius says, that at first *orgia* was a common name for all kinds of sacrifices among the Greeks, of the same import with the word *ceremoniæ* among the Romans.

ORGITANO, in *Biography*, a Neapolitan performer and composer for the harpsichord in 1770, the best which Naples could boast ; but, as a player, much inferior to many at that time in England ; and as a composer, he was surpassed, both in force and good taste, by thousands in Germany. But the Neapolitans, since the time of Memo Scarlatti, have never piqued themselves on instrumental excellence. Vocal compositions and vocal perfection in performance, are the grand desideratum, not only at Naples, but of all Italy.

ORGON, in *Geography*, a river of Chinese Tartary, which rises in N. lat. 46° 56'. E. long. 101° 20', and runs into the Selingue, N. lat. 50°. E. long. 106° 14'. Near this river, in N. lat. 48° 57'. E. long. 104° 36', an assembly of the Kalkas Tartars was held in 1698.—Also, a town of France, in the department of the mouths of the Rhone, and chief place of a canton, in the district of Tarascon ; 17 miles E. of Tarascon. The place contains 2401, and the canton 9401 inhabitants, on a territory of 235 kilometres, in eight communes.

ORGUES, in *Fortification*, thick long pieces of wood, pointed

pointed and shod with iron, and hung each by a separate rope over the gateway of a city, ready on any surprize or attempt of the enemy to be let down to stop up the gate.

The ends of the several ropes are wound round a windlass, by means of which they may be all let down together.

Orgues are preferable to herfes, or portcullices, because these may be either broke by a petard, or they may be stopped in their falling down; but a petard is usefess against an orgue; for if it break one or two of the pieces, they immediately fall down again, and fill up the vacancy; or if they stop one or two of the pieces from falling, it is no hindrance to the rest; for being all separate, they have no dependence upon one another.

ORGUES are also used for a machine composed of several harquebuss or musquet-barrels, bound together; by means of which several explosions are made at the same time; used to defend breaches, and other places attacked.

ORGUES, *des*, Fr. (See ORGAN.) The first organ that was seen in France, and sent to king Pepin, caused great astonishment. Charlemagne, the son of Pepin, received another from the emperor Michael. Eginard says that this was an hydraulicon. In the ecclesiastic interdictions the organ used to be silenced.

Organs were admitted into convents about the tenth century. In the time of St. Louis, every species of wind instrument had admission in the divine offices. We read in the annals of this prince, how devoutly he caused the mass to be sung, and the whole service *à chant et à déchant, à orgre et à triple*, with the organ and trumpet.

ORGYA, *οργυια*, an ancient Grecian measure, containing six feet.

Some represent the orgya as the Grecian pace.

Hefychius describes it as the space comprehended between the two hands, when the arms are extended; answering to the Roman ulna, and our fathom.

ORHAI, in *Geography*, a town of Moldavia, on the Reut; 66 miles E.N.E. of Jassi.

ORI, a town of Sardinia; 8 miles S. of Sassari.

ORIA, a town of Spain, in the province of Granada; 19 miles S. of Huesca.

ORIA, or *Oira*, a town of Naples, in the province of Otranto; the see of a bishop united to Tarento: founded by a colony of Cretans. Here Servilius, one of the officers of Octavius Cæsar, was surprized by Mark Antony; 45 miles N.W. of Otranto.

ORIAGO, a town of Italy, in the Paduan, on the Brenta; 12 miles E. of Padua.

ORIBASIA, in *Botany*. See PSYCHOTRIA.

ORIBASIUS, in *Biography*, an eminent physician of the fourth century, was born at Pergamus, or, as some have asserted, at Sardes, where he resided for some time. He was educated at the school of Zeno the Cyprian, who appears to have taught at Sardes at that time, though he afterwards became one of the most celebrated professors of Alexandria. Oribasius is mentioned by his contemporary, Eunapius, as one of the most learned and accomplished men of his age, and the most skilful physician; and his talents and agreeable manners not only raised him to great public reputation, but obtained for him the friendship of the emperor Julian, who appointed him quæstor of Constantinople. His elevation, and his steady adherence to the principles of Julian, however, procured him many enemies; and after the death of that prince, in the year 363, his fortune suffered a severe reverse. Persecution was carried against him so far, that he was stripped of his property, and, under Valentinian II., was sent into banishment among the Barbarians. He sustained his misfortunes with great fortitude; and the dignity of his character, together with his singular professional skill

and kindness, gained him the respect and veneration of these rude people, among whom he was adored as a tutelary god. At length, however, he was recalled to the imperial court, and regained the public favour. Eunapius represents him as again flourishing in wealth and reputation at Constantinople, at the time when he wrote the lives of the philosophers, which was near the year 400.

Oribasius was principally a compiler; but, on certain practical points, as Freind observes, he has made some valuable remarks, which are not to be found in preceding writers. At the request of the emperor Julian, he made an extensive compilation from Galen and all the other preceding medical authors, in seventy, or according to Suidas seventy-two books, which are entitled his "Collections." But of these only the first fifteen books remain, together with two others, which are called by Rafarius, his translator, the 24th and 25th of the series, and which treat of anatomy. In this work are preserved many passages of ancient writers not to be met with elsewhere, and others are given with more accuracy than in the extant works of the authors themselves. He afterwards drew up an epitome, or "Synopsis" of this great work, for the use of his son Eustathius, reducing the whole to nine books. This synopsis is still extant; as well as four books, on medicines and diseases, addressed to his friend Eunapius, entitled "*Euporistorum, i. e. paratu facilius, &c. Libri.*" Photius mentions two other works of Oribasius, that were extant in his time, one consisting of four, the other of seven books, which were merely an epitome of Galen's works and dedicated to Julian. This epitome is mentioned by Paulus; but it is now lost, as well as some other tracts mentioned by Suidas. The theoretical and anatomical parts of the writings of Oribasius are almost purely transcripts from those of Galen; whence he has been by some nicknamed Galen's ape. But although his books do not contain a great deal that is original, and did not perhaps contribute to the advancement of the art, yet they rank among the more valuable of the medical works of antiquity. He was a great collector of recipes and specific remedies, many of which were afterwards received upon his authority. He speaks in terms of much praise, however, of the success of local evacuations of blood, especially by scarifications, a practice which had not been much noticed by preceding writers. He employed this remedy in suppression of the catamenia, in head-ache, inflammation of the eyes, difficulty of breathing, &c. even in persons of advanced age; and he affirms, that he was himself cured of the plague by it, when it raged in Asia, having lost two pounds of blood from the thighs, on the second day of the disease. Oribasius first described a singular species of insanity, which he called *lycanthropia*, in which the patient wanders about by night among the tombs, as if he were transformed into a wolf. His full and curious description of this disease has been copied by Paul, Actuarius, and others, without addition or alteration, and seems to relate to that species of melancholy, which occurred in the demoniac, mentioned in the New Testament, who abode among the sepulchres.

Various editions and Latin translations of the writings of Oribasius have been published at different times and places. The whole works were printed at Basle, in three volumes folio, in 1557, and in the "*Artis Medicæ Principes*" of Stephanus. The commentaries on the aphorisms of Hippocrates, which were published under his name by Guinther, are obviously spurious, as Dr. Freind has shewn; and the two little tracts, "*De Laqueis et Machinamentis*," collected from Heracles and Heliodorus, are somewhat doubtful. See Freind, *Hist. of Phys. Gen. Biog. Eloy Dict. Hist. de la Med.*

ORICHALCUM, or **AURICHALCUM**, brass. See **BRASS**.

It is evident, from all accounts, that the orichalcum of the ancients was a fictitious substance, not a natural metal. They made it on the same basis that we make brass at present; but they had several ways of doing it, and distinguished it into several kinds. They had a white sort in frequent use and great esteem; and even the yellow they distinguished into two principal sorts, under different names. The orichalcum and *æs flavum*, brass and yellow copper, are with us synonymous terms, but with them they were used to express different combinations of the ingredients.

ORICHALCUM, or *Aurichalcum album*, white brass. This was a metal well known among the ancients, and celebrated by Aristotle and by Strabo, and others, under the name of *χρᾶμα λευκόν*. It was made by mixing an earth with copper, while in fusion; but what that earth was, we are not informed.

None of our methods seem to be the same with their's, since the metal is debased by all our's, and becomes brittle; whereas in their management, according to their own accounts, it seems not to have lost any thing of its ductility, though it acquired a peculiar brightness.

ORIEL WINDOW, in *Architecture*, a projecting angular window, mostly of a triangular or pentagonal form, and divided by mullions and transoms into different bays and other compartments. These windows are not peculiar to the pointed style, as in the barbarous style which succeeded it, during the reigns of Elizabeth and James I., they became still more common than they had been before in the pointed style.

ORIENT, **ORIENS**, in *Geography* or *Astronomy*, the east, or east point of the horizon.

It is thus called from the Latin, *oriri*, to arise; because it is in this point the sun rises.

ORIENT, *Equinoctial*, is used for that point of the horizon wherein the sun rises when he is in the equator, or when he enters the signs Aries and Libra. See **SPRING** and **AUTUMN**.

ORIENT, *Æstival*, is the point wherein the sun rises in the middle of summer, when the days are longest.

ORIENT, *Hybernal*, is the point where the sun rises in the middle of winter, when the days are shortest.

ORIENT, *L'*, in *Geography*, a sea-port town of France, and the principal place of a district and seat of a tribunal, in the department of the Morbihan, situated at the mouth of the river Scorff, and built in the year 1720. The harbour is good, but not capable of receiving many ships of war. The town contains 19,922, and the two cantons 24,722 inhabitants, on a territory of 87½ kilometres, in three communes. N. lat. 47° 45'. E. long. 3° 16'.

ORIENTAL, something situated towards the east with regard to us: in opposition to *occidental*.

In this sense we say, oriental pearls, *q. d.* such as are found in the East Indies. (See **PEARL**.) Oriental languages, meaning the Hebrew, Syriac, Chaldee, and Coptic. (See **LANGUAGE**.) In astronomy a planet is said to be oriental, when it appears in the east before the sun. See **RISING**.

ORIENTAL Bezoar. See **BEZOAR**.

ORIENTAL Bibles. See **BIBLE**.

ORIENTAL Emerald. See **EMERALD**.

ORIENTAL Philosophy, is sometimes used for the philosophy of the East, or that of the Persians, Chaldeans, and Arabians, &c. See **ARABIAN**, **BARBARIC**, **CHALDEAN**, **PERSIAN**, &c. *Philosophy*. See also **BRACHMANS**, **EGYPT**, **MAGI**, &c. It appears, from adverting to the history of the ancient philosophy of the East, that, from the most remote times, the Oriental philosophers endeavoured to explain the

nature and origin of things by the principle of *emanation* (which see), from an eternal fountain of being. That through succeeding ages this doctrine remained, and was taught in schools of philosophy in the more civilized regions of Asia and Africa, is highly probable from various considerations. Nevertheless, this species of philosophy did not exist under any distinct name, nor can it be referred, with certainty, to any single author or leader; but a certain metaphysical system, chiefly respecting the derivation of all natures, spiritual and material, by emanation from the first fountain, was before the commencement of the Christian era taught in the East, whence it gradually spread through the Alexandrian, Jewish, and Christian schools. It is well known, that at the rise of the Grecian sects, the eastern countries were frequently visited by the sages who travelled in search of wisdom. We learn from Clemens Alexandrinus (*Stromat. lib. i.*), who was well acquainted with Oriental history, that the Greeks borrowed what was most valuable in philosophy from barbarians; for philosophy was publicly taught by the Brachmans, the Odrisii, the Getæ, the Chaldeans, the inhabitants of Arabia Felix and Palestine, the Persians, and many other nations. Amongst the Grecian philosophers who travelled into the East was Democritus, who visited Persia, after the schools of the Magi had been reformed by Zoroaster, and travelled to Chaldæa, and other eastern countries, for the sake of learning philosophy. Of the nature of the philosophy which Democritus and others found in these schools, we obtain some idea from the declaration of Pliny (*Hist. Nat. c. 30.*), who says of Democritus, that he undertook, what might be more properly called an exile than a journey, for the purpose of learning "magical philosophy," and returning home, taught it, in his mysteries, from the writings of certain Oriental philosophers, which he illustrated. Accordingly the philosophy of Democritus appears to have been of two kinds; public, or that of the Eleatic sect; and secret, in which he followed the mysteries of the Chaldean, Persian, and other eastern Magi. Hence we may conclude, that the Oriental philosophy subsisted, without interruption in the East, through the period of the Grecian sects.

The uninterrupted continuance of the Oriental philosophy may be further inferred from the sudden rise, and rapid spread, of those numerous heresies, which, under the ostentatious name of Gnosticism, over-ran the churches of the East. (See **GNOSTICS**.) Porphyry, in his preface to a work of Plotinus against the Gnostics, says, that there were at that time many hereties, among whom were some, who, deriving their heresy from the "ancient philosophy," were followers of Adelphinus. From this and similar passages it may be inferred, that prior to the appearance of the Gnostic heresies amongst the Christians, a system, well known by the name of the "ancient philosophy," existed in the East; that this philosophy is not to be sought among the Greeks, not even in Plato himself, but is opposed to the Grecian philosophy, as more ancient and more consonant to the truth; that this philosophy was commonly understood to have been taught by Zoroaster; and that the Christian Gnostics forged books, under the name of Eastern philosophers, from which they pretended to derive their genealogies of emanations from the first fountain of intelligence. Hence also appears the reason, why Plotinus determined to spend eleven years in the East, "to explore the philosophy taught among the Persians and Indians." That the Gnostic heresies were of eastern origin may be further concluded from other circumstances, which it is not necessary now to mention. It deserves, moreover, to be considered, that if all the systems of philosophy, distinct from those of the Grecian sects, which became famous in Asia

Asia or Egypt, particularly if the Egyptian, Cabbalistic, Gnostic, and Eclectic, be compared, there will be found among them a wonderful agreement with the general principles of that system which we call the Oriental philosophy; whence it seems reasonable to admit the existence of this philosophy as a common source, and to make use of it as an universal key to unlock the mysteries of the rest.

Upon the whole we may conclude, that the Oriental philosophy, as a peculiar system of doctrines concerning the divine nature, originated in Chaldaea, or Persia; whence it passed through Syria, Asia Minor, and Egypt; and mixing with other systems, formed many different sects. There seems also to be sufficient ground for referring the formation of the leading doctrines of this philosophy into a regular system to Zoroaster, whose name the followers of this doctrine prefixed to some of their spurious books, and whose system is fundamentally the same with that afterwards adopted by the Asiatic and Egyptian philosophers. Among the branches from the Zoroastrian stock we must reckon the Gnostic heresies, which arose so early in the Christian church. They differ materially from the Platonic doctrine from which they have been supposed to be derived, as Plotinus has fully shewn in his treatise against the Gnostics. The mixture of Platonic notions that are found in the Asiatic philosophy, as well as of Oriental doctrines among the later Platonists, may be easily accounted for from the intercourse which subsisted between the Alexandrian and Asiatic philosophers, after the schools of Alexandria were established. From that time many Asiatics, who were addicted to the study of philosophy, visited Alexandria, and became acquainted with the celebrated doctrines of Plato; and blending these with their own, formed an heterogeneous mass of opinions, which in its turn mixed with the systems of the Alexandrian schools. This union of Oriental and Grecian philosophy was further promoted by the dispersion of the philosophers of Alexandria in the reign of Ptolemy Physcon; many of whom, to escape from tyranny, fled into Asia, and opened schools in many places.

It was probably at the time when the Platonic philosophers of Alexandria visited the Eastern schools, that certain professors of the Oriental philosophy, prior to the existence of the Christian heresies, borrowed from the Greeks the name of Gnostics, to express their pretensions to a more perfect knowledge of the divine nature, than others possessed. That these philosophers assumed this vaunting appellation before their tenets were transferred to the Christians, may be concluded from this circumstance, that we find it, among the Christians, not appropriated as a distinct title to any single sect, but made use of as a general denomination of those sects, which, after the example of the Pagan philosophers, professed to have arrived at the perfect knowledge of God. The Pagan origin of this appellation seems also plainly intimated in two passages in St. Paul's epistles; in one of which he cautions Timothy against *ἀντίθεσιν τῆς ψευδογνῶσεως*, "the opposition of false science" (1 Tim. vi. 20.); and in the other (Coloss. ii. 8.) warns the Colossians not to be imposed upon by a vain and deceitful philosophy, framed according to human tradition and the principles of the world, and not according to the doctrine of Christ. We may conclude, upon the whole, that the tenets of the Gnostics existed in the Eastern schools long before the rise of the Gnostic sects in the Christian church under Basilides, Valentine, and others; but for want of original documents concerning the Oriental philosophy, we can form no idea of its peculiar tenets, only by comparing the ancient doctrines of the East with that of those sects which spring from this stock. The Gnostics were chiefly employed in supporting the system of divine eman-

tion, taught by Zoroaster and his followers. They maintained that all natures, intellectual and material, are derived by a succession of emanations from the infinite fountain of Deity. From this secret and inexhaustible abyss, they conceived substantial powers, or natures, of various orders to flow; till at the remote extremity of the emanation, evil dæmons, or matter, with all the natural and moral evils necessarily belonging to it, were produced. Brucker's Phil. by Enfield, vol. ii.

The first principles of the Oriental philosophy, as Moheim states them, seem perfectly consistent with the dictates of reason; for its first founder must undoubtedly have argued in the following manner: "There are many evils in this world, and men seem impelled by a natural instinct to the practice of those things which reason condemns; but that eternal Mind, from which all spirits derive their existence, must be inaccessible to all kinds of evil, and also of a most perfect and beneficent nature; therefore the origin of those evils, with which the universe abounds, must be sought somewhere else than in the Deity. It cannot reside in him who is all perfection; and therefore it must be without him. Now there is nothing without or beyond the Deity, but matter; therefore matter is the centre and source of all evil, of all vice." Having taken for granted these principles, they proceeded farther, and affirmed, that matter was eternal, and derived its present form, not from the will of the supreme God, but from the creating power of some inferior intelligence, to whom the world and its inhabitants owed their existence. As a proof of this assertion, they alleged, that it was incredible, that the supreme Deity, perfectly good, and infinitely removed from all evil, should either create or modify matter, which is essentially malignant and corrupt, or bestow upon it, in any degree, the riches of his wisdom and liberality.

The Oriental philosophers were divided in their opinion, when they proceeded to argue from these principles. Some imagined two eternal principles, from whence all things proceeded; the one presiding over light, and the other over matter; and, by their perpetual conflict, explained the mixture of good and evil, that appears in the universe. Others maintained, that the being which presided over matter was not an eternal principle, but a subordinate intelligence, one of those whom the supreme God produced from himself. They supposed, that this being was moved, by a sudden impulse, to reduce to order the rude mass of matter, which lay excluded from the mansions of the Deity, and also to create the human race. A third sort fell upon a system different from the two preceding, and formed to themselves the notion of a triumvirate of beings, in which the supreme Deity was distinguished both from the material, evil principle, and the creator of this sublunary world. These, then, were the three leading sects of the Oriental philosophy, which were subdivided into various factions, by the disputes that arose, when they came to explain more fully their respective opinions, and to pursue them into all their monstrous consequences.

The divisions among the various sects of these philosophers, did not prevent their holding, in common, certain opinions concerning the Deity, the universe, the human race, and several other subjects. They were unanimous in acknowledging the existence of an eternal nature, in whom dwelt the fullness of wisdom, goodness, and all other perfections, and of whom no mortal was able to form a complete idea. This great Being was considered by them as a most pure and radiant light, diffused through the immensity of space, which they called *pleroma*, a Greek word which signifies *fullness*; and they taught concerning him and his operations, the following things: "The eternal nature, infinitely

nately perfect and infinitely happy, having dwelt from everlasting in a profound solitude, and in a blessed tranquillity, produced, at length, from itself, two minds of a different sex, which resembled their supreme parent in the most perfect manner. From the prolific union of these two beings others arose, which were also followed by succeeding generations; so that, in process of time, a celestial family was formed in the pleroma. This divine progeny being immutable in its nature, and above the power of mortality, was called by the philosophers, *æon*, a term which signifies, in the Greek language, an eternal nature. How many in number these *æons* were, was a point much controverted among the Oriental sages. See *Æon*.

"Beyond the mansions of light, where dwells the Deity with his celestial offspring, there lies a rude and unwieldy mass of matter, agitated by innate, turbulent, and irregular motions. One of the celestial natures descending from the pleroma, either by a fortuitous impulse, or in consequence of a divine commission, reduced to order this unseemly mass, adorned it with a rich variety of gifts, created men, and inferior animals of different kinds to store it with inhabitants, and corrected its malignity by mixing it with a certain portion of light, and also of a matter celestial and divine. This creator of the world is distinguished from the supreme Deity by the name of demiurge. His character is a compound of shining qualities, and insupportable arrogance; and his excessive lust of empire effaces his talents and his virtues. He claims dominion over the new world he has formed, as his sovereign right; and, excluding totally the supreme Deity from all concernment in it, he demands from mankind for himself and his associates, divine honours.

"Man is a compound of a terrestrial and corrupt body, and a soul which is of a celestial origin, and, in some measure, an emanation from the divinity. This nobler part is miserably weighed down and encumbered by the body, which is the seat of all irregular lusts and impure desires. It is this body that seduces the soul from the pursuit of truth, and not only turns it from the contemplation and worship of the Supreme Being, so as to confine its homage and veneration to the creator of this world, but also attaches it to terrestrial objects, and to the immoderate pursuit of sensual pleasures, by which its nature is totally polluted. The sovereign mind employs various means to deliver his offspring from this deplorable servitude, especially the ministry of divine messengers, whom he sends to enlighten, to admonish, and to reform the human race. In the mean time, the impetuous demiurge exerts his power in opposition to the merciful purpose of the Supreme Being, resists the influence of those solemn invitations, by which he exhorts mankind to return to him, and labours to efface the knowledge of God in the minds of intelligent beings. In this conduct, such souls, as, throwing off the yoke of the creators and rulers of this world, rise to their supreme parent, and subdue the turbulent and sinful motions, which corrupt matter excites within them, shall, at the dissolution of their mortal bodies, ascend directly to the pleroma. Those, on the contrary, who remain in the bondage of servile superstition, and corrupt matter, shall, at the end of this life, pass into new bodies, until they awake from their sinful lethargy. In the end, however, the supreme God shall come forth victorious, triumph over all opposition, and, having delivered from their servitude the greatest part of those souls that are imprisoned in mortal bodies, shall dissolve the frame of this visible world, and involve it in a general ruin. After this solemn period, primitive tranquillity shall be restored in the universe, and God shall reign with happy spirits, in undisturbed felicity, through the everlasting ages." Mosheim's *Eccl. Hist.* vol. i. &c. 8vo.

After all it is not easy to form any very consistent and intelligible notion of the sentiments, either of the Oriental philosophers, or of the ancient Gnostics, who sprung from them. The Gnostics, according to Brucker's account of them, conceived the emanations from Deity, which we have already mentioned, to be divided into two classes; the one comprehending all those substantial powers, which are contained within the divine essence, and which complete the infinite plenitude of the divine nature; and the other existing externally with respect to the divine essence, and including all finite and imperfect natures within the divine essence. They, with wonderful ingenuity, imagined a long series of emanative principles, to which they ascribed a real and substantial existence, connected with the first substance as a branch with its root, or a solar ray with the sun. When they begun to unfold the mysteries of this system in the Greek language, these substantial powers, which they conceived to be comprehended within the *πληρωμα*, divine plenitude, they called *αἰωνες*, *æons*; and they discoursed about them with as much confidence and familiarity, as if they had been objects of sight. The notions which they entertained of these *æons*, like the Platonic notion of ideas, was that of beings which existed distinctly and substantially. Within this series they included the Demiurgus, or maker of the world, whom they supposed to have been an *æon*, so far removed from the first source of being as to be allied to matter, and capable of acting upon it. Having conceived both the spiritual and material world to have flowed from the same fountain, their system required substantial virtues, or powers, of two kinds, active and passive; hence, in their figurative and emblematical language, they speak of male and female *æons*.

ORIFICE, *ORIFICIUM*, the mouth or aperture of a tube, pipe, or other cavity.

There are some operations in chemistry, where the orifices of the vessels must be sealed hermetically.

ORIFICE, in *Anatomy*, is particularly applied to the mouths of the several ducts, vessels, and other cavities; as of the bladder, uterus, stomach, &c.

The upper orifice of the stomach is the part where hunger is felt; the lower orifice is called the *pylorus*.

ORIFICE is also used by extension, for the aperture of a wound or ulcer.

ORIGANUM, in *Botany*, an ancient name, borrowed from the Greeks, and formed of *ορος*, a mountain, and *γανος*, joy, in allusion to its place of growth and agreeable fragrance. Dioscorides has several species of his *οριγανος*, which are easily referrible to some one or other of ours. Linn. Gen. 297. Schreb. 393. Willd. Sp. Pl. v. 3. 132. Mart. Mill. Dict. v. 3. Sm. Fl. Brit. 638. Prodr. Fl. Græc. Sibth. v. 1. 416. Ait. Hort. Kew. ed. 2. v. 3. 411. Juss. 115. Tourn. t. 94. Lamarck Illustr. t. 511. Class and order, *Didynamia Gymnospermia*. Nat. Ord. *Verticillatæ*, Linn. *Labiata*, Juss.

Gen. Ch. *Cal.* a spiked involucre, composed of ovate, imbricated, coloured leaves; perianth unequal, various. *Cor.* of one petal, ringent; tube cylindrical, compressed; upper lip erect, flat, obtuse, notched; lower in three deep nearly equal segments. *Stam.* Filaments four, thread-shaped, as long as the corolla, two of them longest; anthers simple. *Pist.* Germen superior, four-cleft; style thread-shaped, directed towards the upper lip of the corolla; stigma very slightly divided. *Peric.* none, except the closed calyx, containing the seeds in its lower part. *Seeds* four, ovate.

Ess. Ch. Cone quadrangular, spiked, with one leaf to each calyx. Upper lip of the corolla erect, flat; lower in three deep equal segments.

Obs. The involucre affords the essential character of this genus. The perianth is, in some species, nearly equal, of

of five teeth; in others two-lipped, the upper lip large and undivided, the lower scarcely discernible; in a few species it is two-lipped.

1. *O. ægyptiacum*. Egyptian Marjoram. Linn. Sp. Pl. 822. (Zatarhendi; Alpin. Egypt. ed. 1. t. 40. ed. 2. t. 95.)—Leaves orbicular, fleshy, downy. Spikes leafless.—A native of Egypt. Not rare in greenhouses, where it flowers in the summer. The stem is bushy and woody. Leaves numerous, opposite, stalked, orbicular, entire, obtuse, about half an inch wide, tapering at the base, fleshy, downy on both sides, highly fragrant when rubbed, with a nutmeg-like scent. Flowers small, whitish, in dense, clustered, terminal, hairy, obtuse spikes.

2. *O. Dictamnus*. Dittany of Crete. Linn. Sp. Pl. 823. Curt. Mag. t. 298.—Lower leaves woolly. Spikes drooping.—Native of rocks in Crete, nor did the late professor Sibthorp find it in any other place in the Levant. The stem is shrubby. Leaves ovate, clothed with loose wool, aromatic, but not so sweet-scented as the former. Involucrum lax, purplish, smooth, dotted with resinous points. This, the celebrated *δικταμνος* of the Greeks, was reported to cause the arrows to drop out of the wounded goats, as soon as they tasted it; see Ælian. It has been cultivated in our greenhouses as long, perhaps, as any other exotic.

3. *O. Tournefortii*. Dittany of Amorgos. Sibth. in Ait. Hort. ed. 1. v. 2. 311. ed. 2. v. 3. 412. Willd. n. 4. Andr. Repos. t. 537. (*O. Dictamni cretici facie, folio crasso, nunc villosa, nunc glabro*; Tourn. Cor. 13. Voy. v. 1. 91, t. 91.)—Leaves somewhat fringed. Spikes oblong, erect. Corolla with a spur.—Native of rocks in the island of Amorgos, near the convent of the virgin. This has the habit of the last, but the leaves are more rigid, and nearly smooth, except at their edges; spikes longer, erect, and of very numerous flowers, whose corolla has a short spur, an essential mark of distinction between this species, which therefore ought to have been called *calcaratum*, and the last.

4. *O. sipyleum*. Dittany of Mount Sipylus. Linn. Sp. Pl. 823. (*O. montis Sipyli*; Herm. Lugd. Bat. t. 463.)—Leaves ovate, acute, all smooth. Spikes drooping.—Native of mount Sipylus, in Phrygia, and mount Delphi in the Negropont, as well as by the road side between Smyrna and Bursa. Sibth. An elegant perennial herbaceous species, kept occasionally in our greenhouses, of a slender habit, with rather glaucous naked leaves, and short, solitary, lax, drooping, purple spikes.

5. *O. creticum*. Cretan Marjoram. Linn. Sp. Pl. 823. (*O. Onites*; Tourn. Inst. 199. Genuina græcorum hyssopus; Lob. Ic. 494. f. 2.)—Leaves ovate, nearly entire, with roughish veins. Spikes clustered, oblong, erect. Leaves of the involucrum ovate, acute, membranous, smooth.—Native of the south of Europe; a hardy perennial with us, flowering in July and August. This has much the habit of the Common Marjoram of Britain, hereafter described, but the long slender spikes distinguish it, both from that and the following. *O. creticum* is the Wild *Origanum*, or Marjoram, of Dioscorides and of the modern Greeks.

6. *O. smyrnæum*. Smyrna Marjoram. Linn. Sp. Pl. 823. Sm. Fl. Græc. Sibth. t. 571, unpublished. (*O. glandulosum*; Desfont. Atlant. v. 2. 27. Willd. n. 11.)—Leaves ovate, roughish, nearly entire. Spikes nearly globose, obtuse, hairy, collected into a cymbose head.—Gathered by Wheeler and Sibthorp about Smyrna. The latter found it also on heaths about Constantinople. The Turks call it *Sater*, the modern Greeks *ρίζαν*, or Marjoram. This appears, by Vaillant's herbarium, to be the *O. heracleoticum*, *cunila gallinacea* Plinii, *floribus candidis*; Tourn. Inst. 199, which is cited by Linnæus from Bauhin, under

O. heracleoticum. The excellent description in Desfontaines, leaves no doubt as to his synonym. We thus get rid of one species of Willdenow. The round, hairy spikes, collected into a broad-topped cymbose tuft, mark the plant before us.

7. *O. heracleoticum*. Winter Sweet Marjoram. Linn. Sp. Pl. 823. Lob. Ic. 492. Matth. Valgr. v. 2. 60. Ger. em. 666.—Leaves ovate. Spikes elongated, stalked, clustered. Involucrum the length of the calyx.—Native of the south of Europe. Dr. Sibthorp found it frequent on the dry hills of Greece. It has long been a hardy perennial in gardens, flowering from June to November, and is nearly related to the next, as well as to *O. creticum*.

8. *O. vulgare*. Common Marjoram. Linn. Sp. Pl. 824. Curt. Lond. fasc. 5. t. 39. Engl. Bot. t. 1143. Woodv. Med. Bot. t. 164. Camer. Epit. 469. (*O. anglicum*; Ger. em. 666.)—Leaves ovate. Spikes roundish, paniced, clustered, smooth. Involucrum ovate, longer than the calyx.—Native of Europe, in dry hilly places. With us it chiefly occurs in thickets, on chalk or limestone, flowering in July and August. The whole herb has a hot aromatic taste and smell, like thyme. The root is perennial, somewhat creeping. Stems hairy, purple. Leaves entire, dark green, dotted, rather hairy. Spikes numerous, clustered, dense, short, and ovate; their involucrum dark purple; corolla rose-coloured. Bees are fond of the flowers.

9. *O. onites*. Pot Marjoram. Linn. Sp. Pl. 824. (*O. lignosum syracusanum perenne, umbellâ amplissimâ brevi, laeo & nervoso folio nigricante*; Bocc. Mus. 43. t. 38. Majorana cretica, origani folio, villosa, satoreis odore, corymbis majoribus albis; Tourn. Cor. 13, by his own herbarium.)—Leaves heart-shaped, downy. Spikes oblong, obtuse, hairy, clustered.—Native of Sicily, the south part of Greece, and the neighbouring islands of the Archipelago. A pale hairy plant, with white flowers, in short blunt crowded spikes, whose involucre leaves are hairy, and strongly fringed. This plant appears in Hudson's Fl. Anglica, but erroneously, what Dillenius meant appearing to be rather a variety of *O. vulgare*.

10. *O. Majorana*. Sweet Knotted Marjoram. Linn. Sp. Pl. 825. Zorn Ic. t. 41. (Amaracus vulgator; Lob. Ic. 498.)—Leaves stalked, obovate, finely downy, obtuse. Spikes roundish, compact, downy, clustered.—Native of Portugal, long cultivated in gardens, where it is either biennial or perennial, always requiring a little shelter. Its soft downy habit, and sweet aromatic scent, nearly approach *O. ægyptiacum*. The corolla is white. Willdenow's *O. majoranoides* seems to us a variety; and *O. syriacum*, Linn. Sp. Pl. 824, of which there is no specimen in the Linnæan or Bankian herbarium, appears by Lobel's Ic. 499, to be probably the same species as that of which we are speaking.

11. *O. Maru*. Lavender Marjoram. Linn. Sp. Pl. 825. Sm. Fl. Græc. Sibth. t. 573, unpublished. (*Maru creticum*; Alpin. Exot. t. 288. Majorana cretica rotundifolia, lavandulæ odore, capitulis minoribus incanis, flore purpurascens; Tourn. Cor. 13, from his own herbarium.)—Leaves ovate, sessile, downy. Spikes roundish, clustered, downy, somewhat lax.—Native of mountains in Crete. A slender elegant species, unknown in our gardens. The leaves are small, hoary, as are the spikes. Corolla purplish red.

We know nothing of *O. ciliatum*, Willd. n. 5, nor of *benghakense*, n. 6. The former is a native of Guinea; the latter of Bengal; see Burm. Ind. t. 38. f. 3. which figure by no means favours the idea of its belonging to the genus in question.

ORIGANUM, in Gardening, affords plants of the herbaceous, annual, and under-shrubby perennial kinds, of which

the species cultivated are, the common marjoram (*O. vulgare*); the pot marjoram (*O. onites*); the sweet or knotted marjoram (*O. majorana*); the winter sweet marjoram (*O. heracleoticum*); the Egyptian marjoram (*O. Egyptiacum*); and the dittany of Crete or Candia (*O. dictamnus*).

Of the first there are varieties with white flowers, and light-green stalks; with purple flowers, and with variegated leaves; which is sometimes cultivated in gardens, under the title of *pot marjoram*, used in soups.

The fourth sort is at present commonly known by the name of *winter sweet marjoram*, but was formerly called *pot marjoram*, being chiefly used for nosegays, as coming sooner to flower than sweet marjoram.

And there is a variety of it with variegated leaves.

Method of Culture.—The first four sorts may be readily increased by slips, cuttings, and parting the roots, and in the first and third sorts also by seeds.

The seed should be procured fresh from the seed-shops, and be sown in the early spring months, as March or the following month, on a bed or border of good light mould, raking it in lightly. When the plants are up, and have attained a few inches in growth, they should be planted out during moist weather, in a warm dry situation, in rows ten or twelve inches distant, to remain, water being given occasionally till they become perfectly rooted. When the plants are designed for the borders or clumps, the seeds may be sown in patches where the plants are to remain.

The roots of the strongest plants may be parted, so as to have some root-fibres to each in the early autumn or spring season, and be planted out in rows in the same manner as those raised from seed; having the same management afterwards till fresh rooted. The slips or cuttings of the branches should be taken off in the summer, and immediately planted out where the plants are to remain.

All the sorts should be afterwards kept perfectly clean from weeds during the summer season, and in the autumn have the decayed stalks cleared away, loosening the mould about the plants; and when in beds, digging the alleys and throwing a little of the earth over the beds.

Where necessary the plants may be removed into the pleasure ground, with small balls of earth about their roots, either in the autumn or early spring.

The other tender kinds may be increased by planting slips or cuttings of the young shoots, in the spring and summer months; in the former season in pots of light earth, plunging them in a mild hot-bed, but in the latter either in pots or warm shady borders; water being immediately given, and occasionally repeated in small proportions, being covered down by hand glasses in the latter case, to expedite their rooting; being removed, when the plants begin to shoot at the top. In the autumn the plants may be removed into separate small pots, and afterwards treated as the more hardy plants of the green-house kind.

The three first sorts are useful as culinary plants, as well as ornamental in the borders of the pleasure ground; and the other kinds afford variety in the green-house collections.

ORIGANUM, in the *Materia Medica*. See MARJORAM.

ORIGEN, in *Biography*, one of the most celebrated fathers of the church, who flourished in the third century, was born in Alexandria in the year 184 or 185, and was surnamed Adamantius, either on account of his indefatigable application to study, or of the incredible firmness with which he endured the persecutions to which his profession of Christianity exposed him. By Porphyry he is supposed to have been born of heathen parents, and educated in their religious principles; but Eusebius, who wrote his life, has shewn most satisfactorily that his parents were Christians, and that

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they took the greatest possible care of his education. In his childhood he excited the greatest expectations from his quick improvement in several parts of knowledge, especially from his exact and profound acquaintance with the holy scriptures. He is said to have felt difficulties in the course of his reading which his father Leonides was scarcely able to solve, and he would reprove the youth for aspiring to a knowledge of things that seemed to be above his age; at the same time parental attachment led him to believe that his son was intended for great things, and he even hoped that he was honoured with the indwelling of the divine spirit. When Origen was of a proper age, he became a catechumen in the Christian school of Alexandria, under Clement, by whom he was introduced to an acquaintance with the first principles of philosophy, and impressed with a persuasion of its utility as preparatory to the study of Christian truth. After this he attended the philosophical school of the celebrated Ammonius Saccas, the founder of the Eclectic philosophy, which was frequented by Pagans and Christians: here he made a great proficiency in the study of philosophy, and became intimately acquainted with the writings of the Greek philosophers; at the same time, by his talents and unwearied industry, he made himself master of all the learning of the age. In the year 202, when the persecutions of the Christians broke out under the emperor Severus, Origen lost his father, who was first thrown into prison, and soon afterwards suffered martyrdom. On this occasion, the love which Origen bore for his father, and for the truth, on account of which he was doomed to suffer, excited in him so earnest a desire to die in the same cause, and at the same moment, that his mother found it necessary to hide his clothes to prevent him from going abroad, and throwing himself into the way of his persecutors. Being refrained from sealing the truth with his blood, he wrote a letter to his father, in which he exhorted him to constancy, and not to be moved from his steadfastness by compassion for his wife and seven children. The martyrdom of Leonides being followed by the confiscation of his property, his wife and children had, at first, nothing to rely on for support but the bounty of a rich and honourable lady of Alexandria, till Origen, though now but seventeen years of age, was enabled to furnish them with the means of subsistence by teaching grammar. In this undertaking he met with great success, and his school was crowded with young men, both of Christian and Pagan families. At this time the terror of persecution had caused so many to abscond or flee from the city of Alexandria, that there was no one in the public school to teach the principles of the Christian religion, and many heathens came to Origen, desiring to be taught by him. The first of these was Plutarch, who obtained the honour of martyrdom. The second was Heraclius, Plutarch's brother, who became bishop of Alexandria after the death of Demetrius. Origen was not more than eighteen years of age when he was selected to preside over the catechetical schools by appointment of Demetrius: in which important office he gained universal esteem by his frequent visits, and the other kind offices that he performed, to the confessors in prison, whether strangers or friends. No less than seven of his scholars suffered martyrdom, one of whom was a woman. At this time there was no stated salary for the president of the school at Alexandria, and Origen was so unwilling to receive a gratuity from those whom he instructed in the rudiments of the Christian religion, that he preferred selling the books which he had collected with great care, agreeing with the purchaser for four oboli, equal to five pence, to be paid him daily. It was while he was very young, scarcely more than twenty years of

age, that he was guilty of that rash and unjustifiable action, which he intended, as well to preserve him from temptation, as to fulfil upon himself, in a literal sense, the saying of Christ, when he speaks of those "who make themselves eunuchs for the kingdom of heaven." He was afterwards satisfied of his error, and publicly confuted in his writings the literal interpretation of that text, in such a manner, as to shew that he condemned himself.

About the year 213 he went to Rome, having a desire to see the most ancient church of the Romans. Having made a short stay there, he returned to Alexandria, and applied himself with great diligence to the ordinary work of teaching the principles of religion. His reputation was now so great, and the number of his disciples increased so much, that he found it necessary to have an assistant, and selected for this purpose Heraclius, who became bishop of Alexandria after the death of Demetrius. About this time he made himself acquainted with the Hebrew language, and composed his "HEXAPLA;" which see. This work induced numbers of learned persons to resort to Alexandria, for the sake of improving by his conversation and instructions, among whom was Ambrose, a wealthy man, who encouraged him to write commentaries upon the scriptures, by furnishing him with what books he required, and by being at the expence of maintaining seven or more amanuenses to write down what he dictated, and as many young women or others, who excelled in the art of writing, to copy his works. After this he went into Arabia, at the invitation of a prince of that country, to instruct him in the principles of Christianity. During the persecutions of the emperor Caracalla he withdrew into Palestine, where, at the desire of the bishops of the country, he publicly explained the scriptures to the people in the churches, and preached in their presence, though he was only a layman. On his return to Alexandria, he resumed his office in the school, and also his biblical studies. From these he was again called by Mammea, mother of the emperor Alexander, who sent for him to come to her at Antioch, that she might enjoy the benefit of his conversation on religious subjects. On his return he remained at Alexandria till the year 228, when Demetrius sent him on business to Achaia, and in the course of his journey he was ordained presbyter at Cæsarea, a circumstance that gave great offence to Demetrius, who had long been jealous of his increased and increasing reputation, and from this time his conduct towards Origen was marked by the most determined and violent enmity. He procured a decree to be passed, that not only prohibited Origen from teaching any more in the city, but pronounced a sentence of banishment upon him; and he afterwards prevailed on a second council of Egyptian bishops to depose him from the office of presbyter. The bishop of Rome and other prelates concurred in the sentence; but the bishops of Palestine, Arabia, Phœnicia, and Achaia, who were well acquainted with his extraordinary merit, and knew him personally, refused to join in his condemnation, and continued to entertain the respect for him to which he was justly entitled. In the mean time Origen had retired to Cæsarea in Palestine, where he was well received by the bishop of that city and the bishop of Jerusalem, who determined to support him, and commissioned him to deliver interpretations of the scriptures, and other religious instructions. He opened a school here, in which he taught sacred and profane learning to a numerous train of disciples. About the year 240, Origen took a second journey to Athens, where he probably staid some length of time, since he finished at that place his "Commentary" upon Ezekiel, and began that upon Canticles.

When Origen was about sixty years of age, he permitted the discourses which he made to the people to be taken down by short-hand writers: of these there were more than a thousand, being accustomed to preach daily, with little, or scarcely any preparations. About the same period he wrote his eight books against Celsus, his "Commentaries" upon the minor prophets, and upon the gospel by St. Matthew. During the Decian persecution, and in the year 250, he suffered much with exemplary and invincible fortitude, on account of his great zeal in the Christian cause. Though far advanced in life, he was imprisoned and chained down to his place, and in such a situation as to excite the most excruciating pains. But neither his sufferings nor the threats of his persecutors, could shake his constancy, or induce him to behave in a manner in the least unworthy of his Christian profession. From his own letters it appears that he survived this persecution, and afforded arguments for consolation to others who might be placed in the same or similar circumstances. He died, and was buried at Tyre, in the time of Gallus, in the 70th year of his age. His works were very numerous; but though several catalogues of them were composed, none of them are remaining. It was said he had written 6000 volumes, to which Dr. Lardner seems to give credit; but, according to Jerome, they did not amount to more than a third part of that number. A large part of his works is entirely lost, and of those that remain, the greatest portion consists of Latin translations, made by Jerome and Rufinus, chiefly the latter; nevertheless, says Dr. Lardner, "we still have, in the original Greek, Origen's treatise of Prayer: his Exhortation to Martyrdom, addressed to Ambrose and Protoctetus, written in the persecution under Maximin: his Apology for the Christian Religion, in eight books, against Celsus the Epicurean, composed, as some think, in the year 246, or, according to others, not before 249, an excellent performance, greatly esteemed, not only by Eusebius and Jerome, but likewise by many judicious men of later times." Of the high estimation in which this extraordinary man was held, some notice must be taken. Jerome, in his work "*De Viris Illustribus*," calls him a man of immortal wit, and ascribes to him a deep knowledge of logic, geometry, arithmetic, music, grammar, and rhetoric, and of the opinions of all sects of philosophers; so that there was a great resort of persons to him for the sake of instruction: he also styles him the greatest doctor of the churches since the Apostles; in another place, he says, he would willingly undergo all the hatred Origen had ever met with, if he had but his knowledge of the scriptures: again, he adds, that Origen was a great man from his childhood, and the true son of a martyr; that he trampled the world under foot, vanquishing both the love of pleasure and of riches, and that he had the scriptures by heart, and laboured day and night in studying and explaining them. Sulpitius Severus says of Origen, "he wonders how one and the same man could be so different from himself: that where he is right, he had not had an equal since the Apostles." After reciting these and other testimonies to the character and talents of Origen, Dr. Lardner adds from his own reading, that "he had a capacious mind, and a large compass of knowledge; and throughout his whole life was a man of unwearied application in studying and composing works of various sorts, some of them extremely tedious and laborious, and in teaching by word of mouth, in the way of catechetical instruction, public discourses to the people, and conference. He had the happiness of uniting different accomplishments, being at once the greatest preacher, and the most learned and voluminous writer of the age: nor is it easy to say which is most admirable, his learning or his virtue."

virtue. In a word, it must be owned that Origen, though not perfect nor infallible, was a bright light in the church of Christ, and one of those rare personages that have done honour to human nature." The same author enters at large into the nature and moral tendency of the works of Origen, concerning which we refer our readers to the third volume of his "Credibility;" it will be sufficient for us briefly to notice some of the principal, which may be divided into two classes: the former consisting of works upon the sacred scriptures; the latter of separate treatises upon different subjects. We have already referred to the *HEXAPLA*, and shall, in the alphabetical order, give an account of the *TETRAPLA*, which was compiled for the use of such scholars as could not procure the *Hexapla*, and which consisted of the Greek versions of Aquila, Symmachus, the seventy Interpreters, and Theodotion. These works afforded the hint for our Polyglott bibles. The other works of Origen upon the scriptures, consisted of Commentaries upon the books of the Old and New Testament, Scholia, and Homilies. In his Commentaries, the greater part of which is now lost, he appears to have given full scope to his learning and imagination, in illustrating what was the historical or literal; the mystical and moral sense of the sacred writings. Of his "Scholia," which were probably short notes explanatory of difficult passages, none are now remaining; and of his "Homilies," we have only the translations made by Jerome and Rufinus. In the works of Cave and Dupin will be found an account of these remains, and of the collections in which they are separately preserved. With regard to the separate pieces of Origen on different and miscellaneous subjects, we have, besides those to which we have already referred in this article, "A Letter to Africanus concerning the History of Sufannah;" another "Letter to Gregory Thaumaturgus;" fragments of other "Letters," and "Philocalia," containing extracts out of Origen's works by Gregory Nazianzen and Basil the Great; these are in Greek. The Latin translations of Origen's pieces have been accused, and probably with great justice, with a want of fidelity: this is proved by the introduction into them of polemical terms which were not in use till after the council of Nice; and it has been supposed by some learned persons that the pieces still extant in Greek have been interpolated, or otherwise altered, to make Origen speak more agreeably to modern orthodoxy upon original sin, and other controverted points, than he really wrote or thought. The works of Origen, which are communicated to us only through the medium of Latin versions, were collected by Merlin, and afterwards by Erasmus, and published at Paris in 1512, and at Basil in 1536, in two volumes folio. In 1574, a larger collection, including pieces translated by the editor, was published at Paris under the care of Gilbert Genebrard, in two volumes, and was reprinted in 1604 and 1619. M. Huet, bishop of Avranches, published in 1668 the Greek fragments of Origen's "Homilies," and his "Commentaries" upon the scriptures, with a Latin version, to which are prefixed copious and learned prolegomena, under the title of "Origeniana," containing an account of the life and writings of this father. In 1623, Michael Ghisleri published at Rome Origen's "Commentary on the 28th chapter of the first book of Samuel," containing an account of Saul's visit to the pretended witch at Endor, and fragments of his "Commentaries" on the prophecy of Jeremiah, with eight Homilies, on the same book. In 1605, Origen's "Eight Books against Celsus" were published in Greek with a Latin version by Gelenius, and the notes of Hæschelius, and were afterwards given to the public more correctly at Cambridge in 1658 by William Spencer, who improved the

translation, and gave additional notes of his own. This edition comprises the author's "Philocalia five de obscuris Sacre Scripturæ Locis." A complete edition of all the remains of Origen, in Greek and Latin, was commenced at Paris by Charles de la Rue, a Benedictine monk, in the year 1733: the editor died in 1739, when only three volumes of his work were published; but it was continued after his death by his nephew, Charles Vincent de la Rue, a member of the same religious community, viz. St. Maur, who published the fourth and last volume in the year 1759. Cave. Dupin. Lardner, vol. ii. edit. 1788. p. 442—544. Enfield's Hist. Phil. vol. ii. See also our article ORIGENISTS.

ORIGEN, a Gentile philosopher, and a contemporary of the foregoing, was the disciple and friend of Porphyry, and also studied philosophy under Ammonius. This person has sometimes been confounded with the Christian Origen; but he is the same whom Plotinus succeeded in the philosophical chair, and of whom mention is made by Longinus, Porphyry, Hierocles, Eunapius, Proclus, and others.

ORIGENIANS, ORIGENISTS, or *Origeniani*, in *Ecclesiastical History*, a sect of ancient heretics, who resembled or even surpassed the abominations of the Gnostics.

St. Epiphanius speaks of them as subsisting in his time, but in very small number. He charges them with licentious principles, as well as shameful practices. He seems to fix their rise about the time of the great Origen; but does not say they took their name from him. On the contrary, he distinguishes them from the Origenists, whom he derives from Origen Adamantius; adding, indeed, that they first took their name from one Origen; by which he intimates, that it was not the great Origen. And St. Augustine says expressly it was another. As to their doctrine, all that modesty will allow to be said is, that they rejected marriage; that they received and read divers scriptures of the Old and New Testament; that they used several apocryphal books, as the acts of St. Andrew, &c. and that, to excuse their open crimes, they accused the Catholics of doing the same in private.

It is disputed by learned moderns, whom these people followed, and from whom they were named. Basnage thinks it likely that there was some other Origen, unknown to us, who was the author of this sect. Baronius thought there was but one Origen about this time; and that these Origenists had their name from him: of this opinion also are Huet and Pagi. Dr. Lardner professes himself much inclined to the same opinion; and to him it seems that the whole story of the impure Origenists is unfounded. His reasons are, that the story depends entirely upon the authority of Epiphanius, and that the account itself is improbable in itself; because it is hardly credible that men should at any time avow principles and practices so absurd and shameful as those imputed to these people. Besides, they made great pretensions to strict piety; and, moreover, if Epiphanius had had any certain knowledge or good information concerning these people, as a distinct sect, he would have been able to say whom they followed; but he owns that he was an absolute stranger as to that point. Hence Lardner concludes, that this sect of impure Origenists is a fictitious and imaginary sect; owing its supposed existence to the calumnies of some bitter enemy of Origen and his admirers; the credulity of Epiphanius, and his too great facility in receiving the stories brought to him; together with his favourable sentiments of the virtue of the great Origen; for, being persuaded that Origen was a good man, when some angry, not to say wicked, people brought him the relations to which he refers, he concluded there was some sect called Origenists, whose rise and original he could not account for; and therefore he makes a distinct hereof of them. As for the time in which these

people lived, it is sufficient to say, that they were in being in the time of Epiphanius, and probably had their beginning when some persons were distinguished by the name of Origenists. Lardner's Works, vol. iii.

ORIGENISTS, followers of the opinions of Origen, a presbyter of Alexandria, who, in the third century, maintained that Christ is only the Son of God by adoption; that the human soul had a pre-existent state, and had sinned in heaven before the body was created; that the torments of the damned shall not be eternal, but that all intelligent beings shall be restored to order and happiness, and that the devils themselves shall be relieved at last.

Origen, as Mosheim represents him, was a man of vast and uncommon abilities, and the greatest luminary of the Christian world that the age in which he lived exhibited to view. Had the justice of his judgment been equal to the immensity of his genius, the fervour of his piety, his indefatigable patience, his extensive erudition, and his other eminent and superior talents, all encomiums must have fallen short of his merit. Yet such as he was, his virtues and his labours deserve the admiration of all ages, and his name will be transmitted with honour through the annals of time, as long as learning and genius shall be esteemed among men. Dr. Lardner has summed up Origen's character in a passage, for which see ORIGEN. However, Origen, notwithstanding his distinguished abilities, was misled by his imagination, and by that taste for oriental philosophy which prevailed in his time. Enchanted by the charms of this philosophy, (see ORIENTAL Philosophy), he set it up as the test of all religion, and imagined that the reasons of each doctrine were to be found in that favourite philosophy, and their nature and extent to be determined by it; nor can it be denied that many of the corruptions of Christianity proceeded from this source. Hence sprung both the scholastic and mystic theology, and to the sentiments that were now adopted, we may ascribe the rise of monks and hermits. Origen was also misled by his imagination: for having entertained a notion that it was very difficult, if not impossible, to defend every thing in the sacred writings from the cavils of heretics and infidels, so long as they were explained literally, according to the real import of the terms, he maintained that the scriptures were to be interpreted in the same allegorical manner that the Platonists explained the history of the gods. In consequence of this pernicious rule of interpretation, he alleged, that the words of scripture were, in many places, absolutely void of sense; and that though in others there were, indeed, certain notions conveyed under the outward terms, according to their literal force and import, yet it was not in these that the true meaning of the sacred writers was to be sought, but in a mysterious and hidden sense, arising from the nature of the things themselves. This hidden sense he endeavours to investigate throughout his commentaries, neglecting and despising, for the most part, the outward letter. He divided this hidden sense into moral, which displays those doctrines that relate to the state of the soul and the conduct of life; and mystical or spiritual, which represents the nature, the laws, and history of the spiritual or mystical world. This mystical world he again subdivided into two distinct regions, one called the superior, *i. e.* heaven; and the other the inferior, by which he meant the church. And thus he was led to another division of the mystical sense into an earthly or allegorical sense, adapted to the inferior world; and a celestial or analogical one, adapted to the superior region. Origen found a violent enemy in Demetrius, bishop of Alexandria; who obliged him, in the year 231, to retire from his charge in Cæsarea: and farther, to satisfy his vengeance, he assembled two councils at

Alexandria, in the first of which he condemned him unheard; and deprived him of his office; and in the second had him degraded from the sacerdotal dignity. In one of these councils, especially the latter, Demetrius accused him of erroneous sentiments in religion; for it was about this time that Origen published his "Book of Principles," which contains many of his peculiar opinions, which were reckoned of dangerous tendency. However, the character and doctrine of Origen were held by many, and especially by the monks, in the highest veneration, and cherished in this and the following centuries with a kind of extravagant enthusiasm. Hence many commotions were raised in the church, which were terminated by the fifth general council, assembled at Constantinople, by Justinian, A.D. 553, in which Origen and his followers were again condemned. The tenets of Origen which gave the greatest offence were the following: *viz.* 1. That, in the Trinity, the Father is greater than the Son, and the Son than the Holy Ghost. 2. The pre-existence of souls, which Origen considered as sent into mortal bodies for the punishment of sins committed in a former state of being. 3. That the soul of Christ was united to the word before the incarnation. 4. That the sun, moon, and stars, &c. were animated and endowed with rational souls. 5. That after the resurrection, all bodies will be of a round figure. 6. That the torments of the damned will have an end; and that, as Christ had been crucified in this world to save mankind, he is to be crucified in the next to save the devils.

St. Epiphanius insists very largely on the errors of this father: but, as he declares himself too warmly against him, there may be somewhat of exaggeration in what he says. Nor do St. Jerome, who in the earlier part of his life translated many of Origen's works into Latin, and frequently commended him, calling him the greatest doctor of the church since the times of the Apostles, or Theophilus of Alexandria, seem to have kept their zeal within the proper bounds in speaking of Origen. When the Nitrian monks, banished from Egypt on account of their attachment to Origen, took refuge at Constantinople, and were treated by St. Chrysostom, the bishop of that city, with clemency and benignity, the elegant prelate was accused of being an Origenist, and condemned to banishment by the council of Chalcedon, in the year 403. Origenism spread itself chiefly among the monks of Egypt.

The mystical theology of Origen seems to be adopted by our modern Quakers. On the subject of this article consult Mosheim's Eccl. Hist. vol. i. Lardner's Works, vol. ii.

ORIGINAL, a first draught, design, or autograph, of any thing; serving as a model, or exemplar, to be imitated or copied.

Scarcely any of the ancient titles, tenures, &c. are now found in the originals. They are only vidimuses, or copies collated from the originals.

ORIGINAL *Contract*. See CONTRACT.

ORIGINAL *Conveyances*. See CONVEYANCE.

ORIGINAL of a *Deed*, denotes that part or copy which is executed by the grantor, where the several parts of an indenture are interchangeably executed by the several parties; and the rest are "counterparts;" though of late it is most frequent for all the parties to execute every part, which renders them all originals. See DEED.

ORIGINAL *Process*. See PROCESS.

ORIGINAL, or *Original Writ*, is the beginning or foundation of the suit. When a person has received an injury, he is to seek legal redress by application or suit to the crown, for that particular specific remedy which he is advised to pursue. In any action he is to sue out, or purchase by pay-
ing

ing the stated fees, an *original* or original writ, from the court of chancery, in which all the king's writs are framed.

This is a mandatory letter from the king in parchment, sealed with his great seal, and directed to the sheriff of the county in which the injury is committed, or supposed so to be, requiring him to command the wrong doer or party accused, either to do justice to the complainant, or else to appear in court, and answer the accusation against him. Whatever the sheriff does in pursuance of this writ, he must *return* or certify to the court of common pleas, together with the writ itself: which is the foundation of the jurisdiction of that court, being the king's warrant for the judges to proceed to the determination of the cause. In small actions, however, below the value of 40s. which are brought in the court-baron, or county-court, no royal writ is necessary; but the foundation of such suits continues to be, as in the times of the Saxons, not by *original writ*, but by *plaint*; that is, by a private memorial tendered in open court to the judge, wherein the party injured sets forth his cause of action, and the judge is bound of common right to administer justice therein, without any special mandate from the king. Now, indeed, the royal writs are held to be demandable of common right, on paying the usual fees; for any delay in the granting of them, or setting an unusual or exorbitant price upon them, would be a breach of Magna Carta, c. 29. "nulli vendemus, nulli negabimus, aut differemus iustitiam vel certum,"

Original writs are either *optional* or *peremptory*; or, in the language of our lawyers, they are either a "præcipe" or a "fi te fecerit securum;" which fee. Both species of writs are *teste'd*, or witnessed, in the king's own name; "witness ourself at Westminster," or wherever the chancery may be held. (See RETURN and TERMS.) The next step for carrying on the suit, after suing out the original, is called the *process*; which fee.

ORIGINAL *Sin*. See SIN.

ORIGINALIA, in the *Exchequer*, are records or transcripts sent to the remembrancer's office out of chancery.

They differ from *records*, which contain the judgments and pleadings in suit tried before the barons.

ORIGINARY, ORIGINARI, among the Romans, an appellation given to slaves born in their master's houses, who were otherwise called *vernae*.

ORIHUELA, in *Geography*, called *Auriola* by the Romans, *Orzuella* by the Goths, *Orguella* by the Moors, and *Oribuela* by the Aragoneses and the Spaniards, is a tolerably large town of Spain, in the province of Valencia, agreeably situated at the foot of the mountain of the same name, on both banks of the Segura, which runs through it, and which, on the confines of a beautiful country, forms the continuation of the Huerta of Murcia. This town was taken from the Contestani by the Carthaginians, from them by the Romans, and from these by the Goths; it was conquered by the Moors in 715, and at first formed part of the kingdom of Cordova; in 1057 it had its own king, but soon afterwards returned to the kings of Cordova; by a fresh revolution it became dependent on the new kingdom of Murcia, established in 1236; it remained under the Moors for 550 years. It was taken from them in 1264 by James I. king of Aragon, who peopled it with Christians, and in 1537, it received the title of city from Alphonso V. In 1648, it was depopulated by the plague; and the overflowing of the Segura in 1651, destroyed a great part of it. This town is narrow, but as it winds round the foot of the mountain, its extent is considerable. It is tolerably well built; the streets are in general airy, straight, and broad, but not paved. The eleven principal streets are handsome,

and the broadest of them have pavements on each side. It has many regular edifices, and houses of good appearance. It has two bridges over the Segura, seven gates, and five squares. It has no fountains, so that the inhabitants drink the water of the Segura. The population is about 20,000 persons. In 1564, pope Leo X. established a bishop's see in this place, which has continued ever since, and it has a cathedral chapter. Here are three parish churches, nine monasteries, three nunneries, a hospital for the sick, a foundling hospital, and a tribunal for the cognizance of causes arising in the diocese. Besides a number of officers for the civil and military administration, it has a garrison of two squadrons of cavalry, or of dragoons. In this city is an university, founded in 1556, for the four learned professions; here are also one seminary and two colleges, one of which accommodates about 300 young men. A small theatre was erected in this place by a private gentleman in 1791, and from the month of October to the month of April it is much frequented. At Orihuela they manufacture those curious snuff-boxes with the roots of the terebinthus, called in Spanish "Cornicabra," which are so much admired on account of their beautiful shades, representing landscapes, &c. The inhabitants are commended for the suavity of their manners, and for the industry with which they cultivate the adjacent lands. The country about the town is very beautiful, and forms a succession of gardens, producing abundance and variety of fruits, such as oranges and lemons, almonds and pomegranates. The fertility of the soil has occasioned a proverb, "rain or no rain, there is wheat in Orihuela." Here are raised silk-worms in great number; which furnish the inhabitants with a new source of wealth. N. lat. 38° 7'. W. long. 1° 5'.

ORIHUELA, a town of Spain, in the province of Aragon; 18 miles N.W. of Albarracin.

ORIHVASI, a town of Sweden, in Tavastland; 40 miles N. of Tavasthus.

ORIJAVA, a town of Spain, in the province of Granada; 12 miles N. of Motril.

ORILLAH, a town of Bengal; seven miles W. of Ramgur.

ORILLON, in *Fortification*, a small rounding of earth, lined with a wall; raised on the shoulder of those bastions that have casemates, to cover the cannon in the retired flank, and prevent their being dismounted by the enemy. The method of describing orillons and retired flanks, according to M. Vauban's first method, is stated under the article *Military CONSTRUCTION*.

ORIMATELA, in *Geography*, a town of Sweden, in the province of Tavastland; 45 miles E.S.E. of Tavasthus.

ORING, a lake of Thibet, 63 miles in circumference. N. lat. 34° 47'. E. long. 97° 29'.

ORINGA, a sea-port of Japan, in the island of Nippon.

ORINIACOORA, a town of Bengal; 15 miles N. of Nuldingah.

ORINOKO. See OROONOKO.

ORINZA, a town of Persia, in the province of Irak; 41 miles E. of Ispahan.

ORIO, or ORIA, a town of Spain, in Guipuscoa, on the sea-coast, at the mouth of a river of the same name, surrounded by walls; four miles W. of St. Sebastian.

ORIOULUS, the Oriole, in *Ornithology*, a genus of birds of the order Picæ, of which the generic character is: a conical, convex, very sharp pointed and straight bill; the upper mandible is a little longer than the lower, and obscurely emarginated; the tongue is bifid and sharp; and the feet are formed for walking. There are 51 species described in Gmelin's Linnæus; the birds are generally described as gregarious,

gregarious, noisy, numerous, voracious, and great devourers of corn. The greater number of the species belonging to this genus are natives of the American continent; they are remarkable for the structure of their nest, which in some species hangs from the branch to which it is attached, and in others it is sewed or fastened with peculiar art beneath the surface of some very large leaf.

Species.

* **GALBULA**, or Golden Oriole, sometimes denominated the golden thrush, is of a pale yellow colour; the lores and limbs are black; the outer tail-feathers on the hind part are yellow; the bill and irides are red; the legs plumbeous; the female is of a dusky brownish-green; the lateral tail-feathers are of a yellowish-white. This is an inhabitant of our own country, and is found also in other parts of Europe, in Africa, and in Asia, is about nine inches and a half long; is migratory; feeds on cherries, berries, and insects. Its nest is in the shape of a purse, fastened to the extreme divarications of the outmost twigs of tall trees, and composed of fibres of hemp, or straw, mixed with fine dry stalks of grafs, lined within with moss and lichens, upon which are arranged still finer materials, as the silken bags of the chrysalides of moths; the egg-bags of spiders, feathers, &c. It is usually observed to build generally in high trees, but places its nest in rather a low part of the tree; the usual number of eggs is four or five, and their colour a dull white, with numerous dark specks. She sits three weeks, and will not unfrequently suffer herself to be taken with the eggs and nest, and continue to sit on them in a cage till she dies. The golden oriole is partial to grapes, figs, cherries, and insects. It has a loud cry, and its flesh is reckoned wholesome and pleasant to the taste.

There are four other varieties of this species. 1. The black-headed oriole, described by Edwards under the title of the black-headed icterus, which differs in having the whole head and throat black, the greater quills black, longitudinally streaked with yellow; the tail and bill reddish, and the legs dusky. It is a native of Madras. 2. The mottled oriole, which is yellow variegated with blackish spots; the head, neck, quill, and tail-feathers blackish. It inhabits Madras, and is described by Edwards under the title of the yellow Indian starling. 3. The Chinese oriole, whose limbs are black with yellow tips; head with a black band. It inhabits divers parts of China and Cochinchina. 4. The Indian oriole, of which the head is marked with a transverse blue band; the tail-feathers are yellow with a blue bar; quill-feathers yellow spotted with blue. It inhabits India.

RADIATUS; or Striped-headed Oriole. This species is tawny; the head, chin, and throat are black dotted with white; the remainder of the bird is orange-coloured. It is not ascertained to what country this bird belongs; it is the size of a black-bird, the body is pale beneath; the legs are yellow; the claws are reddish.

PICUS; Climbing Oriole. Tawny; the head, neck, and breast are spotted with white; the tail is rounded; the bill of a yellowish-grey; the legs are blackish. It is about seven inches long; inhabits among the trees in Guiana, which it climbs like a pie, and picks out insects from under the bark.

ICTERUS; Icteric Oriole. This is also tawny; the head, throat, back, quill and tail-feathers are black; the wings are marked with a white spot. The bill is mostly black with a brown base; the irides are yellowish; the legs are sometimes black, and sometimes lead-coloured, or of a greyish-white. It is about nine or ten inches long. It

inhabits the warmer parts of America, and the Caribbee islands. It is domesticated for the purpose of killing insects. In its wild state it is very agile and bold. It builds a large cylindrical nest, suspended to the end of a twig of a tree, with a view, no doubt, to defend its young from the attacks of snakes and other animals. Of these nests several may sometimes be seen near each other, and not far from houses.

NOVÆ HISPANIÆ; Mexican Oriole. This species is yellow; the head, chin, quill-feathers, and tail are black. It inhabits New Spain, whence it derives its specific appellation. The bill is long and yellow.

ANNULATUS; Ring-tailed Oriole. This species is yellow; the head and neck black; the greater wing-coverts and quill-feathers are blackish, with a yellowish edge; the tail is annulate and blackish. It is described and figured by Seba, is the size of a pigeon, and is a native of South America.

PICTUS; Painted Oriole. The front of this species is yellow; the nape orange-coloured; back yellow; cheeks, rump, and belly blueish; the shoulders are brown; the quill and tail-feathers are black. It is supposed to be an inhabitant of America.

BRASILIANUS; Brazilian Oriole. Yellow; breast spotted; head and back with pale brown spots; belly white; tail and wings brown; the latter tipped with whitish. It inhabits the shrubby places in Jamaica, and is four inches long. The bill is half an inch long; the orbits are yellow; legs brown, claws yellow.

JAPACANI; Japacani Oriole. The colour of this species is black mixed with a pale brown; beneath it is varied, with white and yellow, with transverse black lines; head and tail blackish. Inhabits Brasil, and is eight inches long; the bill is black; the irides golden; the legs are of a dirty-white; claws sharp and black. It is described by Ray, Willughby, and Latham.

COSTOTOTLI; or New Spain Oriole. Black; beneath and tail variegated with saffron and black. It inhabits New Spain, and is about the size of a starling. The young are said to be yellow except the tips of the wings, which are black.

GRISEUS; Grey Oriole. This is varied with yellow and black; back, thighs and belly cinereous. It inhabits the woods of New Spain, is the size of the last; it does not sing, and the flesh is good.

PHENICÆUS; Red-winged Oriole. This species is black, but the wing-coverts are tawny; it is the size of a starling; the length being from eight to nine inches. It is to be met with in Mexico, the Carolinas, Virginia, and as far as New York. It builds a thick pensile nest among reeds, or between the forks of trees, three or four feet from the ground, along with other birds, in swamps which are rarely accessible by man. In Louisiana these birds appear only in winter, and sometimes in such immense flocks, that three or four hundred may be taken at one draught of the net. The nets are spread on some bare smooth path, at the side of a wood, with rice strewed to decoy the birds. To secure the multitudes that are caught, it is often necessary to kill the greater part upon the spot. Their trivial or common name is "Maize-thief," which they have acquired from the circumstance of their pecking a hole in the plant when green, and so destroying it. They are very bold, and not to be terrified with a gun, for notwithstanding the sportsman makes great slaughter in a flock, the remainder will take a short flight, and settle again in the same field. There is a variety found in Africa with the shoulders red, edged with yellow.

AMERICANUS; Red-breasted Oriole, or Mocking-bird of Guiana. Black; chin, throat, breast, and upper corner of

of the wings red. It is seven inches long, is less than a black-bird, and inhabits Guiana and Cayenne. It sings very pleasantly, and imitates the notes of other birds. The nest, which is built of hay, is long, cylindrical, twelve or fifteen inches in circumference, and hangs from the branches of the tallest trees.

ORYZIVORUS; Rice Oriole. Black; head, neck, and breast with a purple shade. It inhabits Cayenne, and is nine inches long. The bill is about one inch and a half long, convex, and protuberant at the base.

LUDOVICANUS. This is variegated with black and white; the head, neck, belly, and rump are white; the wings and wedged-tail violet, edged with white. It inhabits North America, principally Louisiana, and is ten inches long. The bill is black, and is about an inch long; the legs are of a lead-colour. There are two varieties of this species: 1. Blackish-brown; neck, breast, and wings spotted with black; head white, with a black spot on the crown. It is found in Hudson's Bay. 2. Blackish-green; head, chin, outer quill-feathers, thighs, and streaks on the breast white. This also is found in Hudson's Bay.

CRISTATUS; Crested Oriole. Crested; lower part of the back, rump, and vent chestnut; lateral tail-feathers yellow. This is the largest species yet known, and is a native of Surinam. It is about the size of a magpie, and its length is from eighteen to twenty inches. The colour of the male is black, with the lower part of the back, the rump, and vent chestnut; and the lateral tail-feathers yellow. The head is furnished with a narrow recumbent crest; the bill is of a dull yellow, and the legs black. The female is said to be of an olive colour; the quills are dusky, and the tail yellow, as in the male, with the middle feathers black; the head is crested, and the eyes in both sexes are of a bright blue. Nothing is known of the particular history of this species, except that it feeds on insects and fruits, and that it has a strong scent, resembling castor. "If," says Dr. Shaw, "it resembles the majority of this genus in its manner of building, it may perhaps be the fabricator of the very large hanging nest, described by Grew, in his account of the Museum of the Royal Society. It is above three quarters of a yard long, besides part of it broken off: where broadest, near a foot over, and almost flat; narrowed from the bottom all the way to the top. It hath two apertures: above, about a foot from the top of the entire nest, one larger and longer; below, that is, a foot above the bottom, another perfectly round, and three inches over: it consists of the parts of plants somewhat loosely woven together." There are two varieties of this species: 1. One is of an olive-brown; beneath bay; the two middle tail-feathers chestnut, the lateral ones yellow. It inhabits Cayenne, and is twenty inches long. The bill of this variety is yellow; hind-head with two long pendent bristly feathers. 2. The body of this on the fore-part is green, the hind-part is chestnut; the quill and two middle tail-feathers are black, the lateral ones yellow; the bill is red. It inhabits Cayenne, and is fourteen inches long.

HÆMORRHIOUS; Red-rumped Oriole. This species, which is black, and the rump scarlet, inhabits Brazil, is eleven inches long, and is reckoned a very elegant species, though the colours are plain rather than splendid or glaring. Specimens have been seen, perhaps such as had not attained their full colours, in which the back was of a brown tinge, the rump of a pale red, and the vent yellow. The nest of this bird resembles a narrow cucurbit with its alembic, the total length being about eighteen inches, but the interior cavity is only twelve inches; the upper part, by which it is attached, is dense and strong for about the length of six

inches. The hæmorrhous prefers building on such trees as overhang a river or lake. There is a variety which is found at Guiana, and which is of a blackish-brown colour, with a yellow vent.

PERSICUS; Black and Yellow Oriole. Black; hind-part of the back, spot on the wing-coverts, and base of the tail-feathers yellow. It is found in South America; forms a pendent nest, similar to the one just described, on the extreme branches of trees, of which there are sometimes four hundred together. The eggs are of a dirty white, with small pale brown spots. There are two varieties: 1. Black; hind-part of the back, spot on the wing-coverts, and outer tail-feathers above yellow at the base, all beneath half yellow and black. 2. Purplish-black; spot on the wings yellow, varied with black. The bill is yellowish; irides blue; legs and claws black.

MEXICANUS; Black-crowned Oriole. Blackish; beneath and on the head yellow. It inhabits New Spain and Cayenne, and is nearly nineteen inches long. The bill, legs, and claws blackish; the neck is yellow; the crown black-brown; tail and wings black.

RUBER; Red Oriole. Vermilion; wings, belly, and tail deepest black. The bill and legs black; irides flame colour. This bird is of the size of a black-bird, and is found at Antigua, in the isle of Panay, one of the Philippines.

GUIANENSIS; Guiana Oriole. Blackish; edges of the feathers grey; breast and neck beneath red. It inhabits Guiana, as its name imports, and is above seven inches long. The tail is striate with grey; the legs and claws are brown.

FLAVUS; Antigua Yellow Oriole. Golden; hind-part of the back, wings, and tail are black. The bill and legs are black; the irides are red. It is the size of a black-bird, and, according to Sonnerat, is a native of Antigua, in the isle of Panay; but it is also found about the river Plata, in South America.

BALTIMORE; Baltimore Oriole. Blackish; beneath and band on the wings tawny. The bill is of a lead-colour; greater wing-coverts black, tipped with white; first quill-feathers dirty white, edged with white; two middle tail-feathers black, the rest black on the lower part, and orange above. In the female, the head and back are olive, edged with brownish; body beneath and tail-coverts yellow; tail grey, edged with white. This species is found in many parts of North America, occupying chiefly the more northern parts, advancing even to Montreal in the month of May, and returning southward in winter, which accounts for their appearance in Maryland and Virginia at that time. They make their nest of a soft downy matter, in the shape of a purse, tying it with threads to the extreme forks of twigs of the tulip, plane, and hickory trees. The country people call them *fire-birds*; and indeed, when in high plumage, their motions from branch to branch not unaptly resemble a flash of fire.

SPURIUS; Baltard Oriole. Black; beneath tawny; wings with a white bar. It inhabits North America, is shorter than the Baltimore oriole; builds a pensile nest, and lays five eggs. The lower part of the back and tail-coverts yellow; quill-feathers grey, edged with white; tail black, wedged. The head and neck of the female are of an olive colour; the chin is black; wing-coverts and tail-feathers grey, edged with white; tail dirty white, edged with yellow.

TEXTOR; Weaver Oriole. This is of a yellow colour; head brown, with a shade of golden; quill and tail-feathers blackish, edged with orange. It inhabits near Senegal, and

ORIOLES.

is of the same size as the golden oriole. "It was observed," says Mr. Latham, "in a cage where these birds were kept, that they entwined some of the stalks of the pimpernel, with which they were fed, in the wires. As this seemed to shew a disposition of making a nest, some rush-stalks were put into the cage; on which they presently made a nest, large enough to hide one at least: but it was as often deranged as made, the work of one day being spoiled the next; serving to shew that the fabrication of the nest, in a state of nature, was the work of both male and female, and in all probability is finished by the last. They had a sharp but lively note.

BONANA; Bonana Oriole. This is also named the fulvous oriole, on account of its tawny colour. The head and breast are chestnut; back, quill, and tail-feathers are black; the lower part, rump, belly, thighs, vent, and under wing-coverts orange-red; the vent is varied with chestnut; the greater wing-coverts, quills, and tail are black; the bill is black, with greyish base; legs are grey. The female differs from her mate in being of a less lively colour. It is a native of the West India islands, building its nest in a remarkable manner of fibres and leaves, formed into the fourth part of a globe, and attached to the under-side of a banana leaf, in such a manner that the leaf itself forms one side of the nest, which, at first sight, appears to be made of horse-hair, but, on a nearer inspection, is found to be composed of branched fibres, and which are in reality those of the *Tillandria usneoides*.

NIDIPENDULUS; Hang-nest Oriole. Frontlet and wreath black; crown, neck, back, and tail reddish-brown; breast and belly tawny-yellow. The bill is white; wings dusky-brown, mixed with white. This bird builds in woods, making its nest of the internal fibres of the parasitic plant, known in the West Indies by the name of "old man's beard." It sings charmingly, and places its nest on the external branch of a high tree.

VARIUS; Chestnut and Black Oriole. Black; beneath, rump, and lesser wing-coverts ferruginous. It inhabits Cayenne, and is about six inches long.

XANTHORUS; Lesser Bonana Oriole. Pale yellow; chin, quill, and tail-feathers black. It inhabits Jamaica and New Spain, and is seven inches long. The wing-coverts are black, the greater part of them is edged with white.

DOMINICENSIS; St. Domingo Oriole. Black; body on the hind-part, wing-coverts, and spot on the wings pale yellow. It is found in New Spain, Jamaica, and St. Domingo; is about eight inches long; builds a purse-shaped nest on the extreme branches of trees, hanging over water.

JAMACAN; Brazilian Oriole. This species is yellow; the head, throat, spot on the shoulders, wings, and tail black. It inhabits, as its trivial name imports, Brazil; fixes its nest to a plantain leaf by means of filaments, and is ten inches long. The bill is black; wing-coverts have a white spot in the middle; the legs are brown.

CAYANENSIS; Yellow-winged Oriole. Black, with a yellow spot on the wings. Bill black; tail rounded, a little wedged at the tip.

LEUCOPTERUS; White-winged Oriole. Black, with a white spot on the wings. The female is of a cinnamon-brown colour, but beneath it is somewhat cinereous. It is a native of Cayenne and Surinam, and is about eight inches long.

ICTEROCEPHALUS; Yellow-headed Oriole. Black; head and neck yellow. The bill is blackish; legs and claws brown. It inhabits Cayenne, and is seven inches long.

MELANCHOLICUS. This is the Schomburger of Edwards. It is grey, dotted with black, with a black band over the

eyes. It is the size of a lark, which it considerably resembles in colour. The bill and legs of a flesh colour; the irides are bay; feathers with each a blackish spot in the middle; quill-feathers and tail blackish, edged with tawny brown; cheeks and chin black. It is a native of Mexico. There is a variety, in which the plumage is of a brighter cast, or more inclining to orange-colour. The head is marked on each side by a white eye-stripe, bordered above and below with black; the irides are of a reddish-orange hue. It is found in Cayenne.

CAPENSIS; Olive Oriole. This is, as its trivial name denotes, of an olive-brown colour, but beneath it is of a pale yellow. The bill, legs, and claws are brown; colour on the crown is inclining to grey, on the chin and throat to orange; the wing-coverts are brown, edged and tipped with olive; quill-feathers brown, edged with olive.

CÆRULEUS; Blue Oriole. Black, cinereous; head, wings, and tail blue. The bill is tawny. It is found at Madras.

TRIFACIATUS; Triple-striped Oriole. Bluish lead-colour; the head has a triple stripe of black, and waved with black on the sides; the lower part of the back and rump are of a jonquil yellow. This is an Indian bird.

VIRIDIS; Yellow-throated Oriole. Green; eye-brows, cheeks, and chin yellow; some of the wing-coverts tipped with white. The bill is corneous; the legs grey. It inhabits Hudson's Bay, and is about nine inches long.

FERRUGINEUS; Rusty Oriole. Black; edge of the wings rusty; head and neck purplish-black; belly of a dirty-ash. The bill and legs are also of a dirty-ash; the areas of the eyes are black; wings and tail have a greenish shade.

FUSCUS; Brown-headed Oriole. Black, head rusty-brown; the tail is of a dirty-ash colour. It is a gregarious bird, and is found in New York.

NIGER; Black Oriole. This is totally black; but the female is greenish-brown; beneath and on the head inclining to cinereous. It inhabits North America; is about ten inches long; is gregarious, and in brooding time sings delightfully, feeds on worms and beetles; builds in trees about eight feet from the ground, and lays five eggs, that are dusky, with black spots.

MINOR; Lesser Black Oriole. Black; head mixed with a little blue. The head of the female and the neck are of a dusky colour; wings and tail blueish.

OLIVACEUS; Cayenne Olive Oriole. Olive; head, chin, throat, and breast brown; wings black. It inhabits Cayenne, and is six inches long. The bill and legs are black.

AOONALASCHKENSIS; Aoonalashkan Oriole. This species is brown; spot under the eyes and chin white; the throat and breast are of a rusty-brown; bill and legs brown. It is about eight inches long, and inhabits the island Aoonalaska.

CAUDACUTUS; Sharp-tail Oriole. Variegated; tail-feathers sharp-pointed. It inhabits New York; the size of a lark.

SINENSIS; Kink Oriole. White; head, neck, breast, and upper part of the back cinereous; quill-feather steel-blue; tail rounded, half of it is white, and half steel-blue. It inhabits China, and is about six inches and a half long.

AUREUS; Tawny-yellow Oriole. This, as its trivial name imports, is of a tawny-yellow colour; frontlet, chin, primary tail-coverts and feathers black at the extremity; the bill is brown. It inhabits India; and is eight inches long.

VIRIDENS; Whistling Oriole. Olive, beneath inclining to green; tips of the wings and lower coverts yellow, the upper

upper and greater brown, edged with yellow; tail rounded. The bill is corneous; legs and claws grey.

FURCATUS; Fork-tailed Oriole. Black; back, rump, quill-feathers and forked tail inclining to blue, lower tail-coverts white. Bill yellow; tail long; legs and claws black. It inhabits St. Domingo; and is about seven inches long.

CHRYSOCEPHALUS; Gold-headed Oriole. Black; cap, wing, and tail-coverts pale-yellow. The hind-head and thighs golden; bill black; legs and claws black-brown. It inhabits America, and is above eight inches long, but in bulk it is about the size of a lark.

ORION, in *Astronomy*, one of the brightest constellations of the southern hemisphere: and as it occupies a large space there, this circumstance may probably have given the ancients, and particularly Pindar, occasion to say that Orion was a person of a monstrously large size, which Manilius expresses in these words: "magni pars maxima cœli." Nothing was more noted among the ancients than this constellation. It is mentioned in several passages of the Bible, viz. Job, ix. 9. Ezek. xiii. 10. Amos, v. 5. And both the Septuagint and the Vulgate call it Orion, as well as the Greeks.

The word is formed from the Greek *ορειν*, to make water; the ancients supposing, that it raised tempests at its rising and setting.

The stars in the constellation Orion, in Ptolemy's catalogue, are thirty-eight; in Tycho's and Hevelius's, sixty-two; in the Britannic catalogue, seventy-eight. See **CONSTELLATION**.

ORION, in *Mythology*, furnishes a fable that is the most celebrated, and at the same time most obscure in antiquity. The birth of Orion exhibits a mystery equally indecent and difficult to be understood. As Jupiter, it is said, Neptune, and Mercury were travelling on the earth, they lodged with Hyrieus, erroneously named Byrseus in Hyginus, and were so pleased with their entertainment, that they asked him what was the chief object of his wishes, promising to bestow it upon him. Hyrieus answered, that having no children, these were what he chiefly desired; and soon after Orion was born in the manner related by Hyginus: "Mercurius," says he, "de tauro quem Hercules immolaret, corium pertulit. Illi (i. e. Jupiter, Neptune, and Mercury) in eum urinam fecerunt, et in terram obruerunt, unde natus est Orion;" and hence he obtained the name of Ourion, or Arion. Afterwards, to obliterate the memory of his birth, the first letter of his name was changed, and he was called Orion, which Ovid thus expresses:

"Perdidit antiquum litera prima sonum."

Homer, who mentions Orion repeatedly, says nothing of the fable of his birth, which probably was not invented in his time. It is certain that Orion signalized himself by his attachment to the science of astronomy, which he had learned from Atlas, who, according to Homer, dwelt in the vicinity of Tanagra, upon a high mountain, from whence he studied the heavens, or in the island of Calypso, his daughter. Moreover, Orion was passionately fond of hunting; and this circumstance was the foundation of the connection of his history with that of Diana. Homer is the first who attributes Orion's death to the jealousy of Diana:

"So when Aurora fought Orion's love,
Her joys disturb'd your blissful hours above,
Till in Ortygia, Dian's winged dart
Had pierc'd the hapless hunter to the heart."

Pope's *Odyss.* v. 155.

Pausanias says, that Orion's tomb was to be seen at Tanagra in Bœotia; but this was probably merely a cenotaph; since he was actually interred in Delos, called Ortygia.

The circumstance of the three divinities, who are said to have lodged with Orion's father, led our Hebraizers to believe, that this fable was the same with, or at least a copy of, the story of Abraham's entertaining the three angels, who came and foretold to him the birth of a son, though Sarah his wife was then superannuated. M. le Clerc (*Bibl. Univ.* t. vi.) had this notion of it, without insisting, however, upon the Greek and Hebrew etymologies, which might have given some probability to this assertion. Blæu, who took the name of Cœsius (*Cœl. Poet. Astr. Art.* of Orion) insinuates, that this same fable had a great resemblance to the story of Jacob, so much the more as the name of Jacob's staff is given to the three brightest stars in the constellation of Orion; and the name of Jacob, which signifies "strong against the Lord," upon account of the mysterious combat he had with an angel, may have given rise to it. Besides, the Arabians call the constellation of Orion, "Algebar," or "Algebaou," the strong, the giant. The Abbé Fourmont has also argued that this story is the same with that of the venerable patriarch. In favour of this sentiment, the authors have to allege, that Orion, being of Tanagra, a city of Bœotia, the country where Cadmus settled, and having there introduced the religion of the Phœnicians, the history of Abraham, so celebrated in all the East, might have been known there.

ORION'S River, in *Astronomy*, a constellation, called also *Eridanus*; which see.

ORIPAA, in *Geography*, a town of Sweden, in the government of Abo; 27 miles N.N.E. of Abo.

ORIS COLUMNA. See **COLUMNA**.

ORIS Distortor. See **DISTORTOR**.

ORIS Speculum. See **SPECULUM**.

ORISICCHIO, in *Biography*, an eminent composer for the church, at Rome, in 1770. He then ranked so high for the elegance, as well as science, of his ecclesiastical compositions, in Pergolesi's style, that upon any festival, wherever he was maestro di cappella, and had composed a mass, there was sure to be a great crowd.

ORISSA, in *Geography*, a province of Hindoostan, bounded on the north by Bahar and Bengal, on the east by the northern circars and the bay of Bengal, on the south by Golconda, and on the west by Berar. It was formerly a kingdom, till reduced by Akbar in 1592, and extended from the bay of Bengal to the coast of Coromandel; but it is not now so extensive. Under Aurungzebe, it yielded a revenue of 36 lacks of rupees. The soil is flat, moist, and fertile, and the heat excessive. Orissa is nominally one of the British provinces, though only a small part of it is subject to the Bengal government. The districts of Midnapour are possessed by the British nation; the remainder being in the hands of the Mahrattas, and their tributaries.

ORISTAGNI, or **ORISTANO**, a town of the island of Sardinia, situated on the west coast, on a gulf to which it gives name; the see of an archbishop; fortified, but thinly inhabited; 38 miles N.W. of Cagliari. N. lat. 39° 48'. E. long. 8° 50'.

ORISTAL, a river of Mexico, which runs into the bay of Honduras, N. lat. 15° 48'. W. long. 86° 35'.

ORITES, in *Botany*, *ogelins*, inhabiting billy places, Brown Tr. of Linn. Soc. v. 10. 189. Prodr. Nov. Holl. v. 1. 387.—Class and order, *Tetrandria Monogynia*. Nat. Ord. *Proteaceæ*, Juss.

Eff. Ch. Petals four, equal, recurved at the summit. Stamens inserted above the middle of the petals, prominent.

4 A

Nectariferous

Nectariferous glands four. Germen sessile. Style straight. Stigma obtuse, vertical. Follicle leathery. Seeds two, winged at the top.

1. *O. diversifolia*.—Leaves flat, lanceolate, toothed or entire, slightly downy beneath. Suture of the follicle abrupt.—Native of the highest mountains of Van Diemen's land.

2. *O. revoluta*.—Leaves revolute, linear, entire; clothed with hoary down beneath. Suture of the follicle rounded.—Found in the same country.

These are shrubs, with alternate leaves, which are either entire or toothed. Spikes axillary or terminal, short, composed of pairs of hermaphrodite flowers, each pair accompanied by one bractea. Brown.

ORITES, in *Natural History*, the name of a stone described by the ancients, and celebrated by the writers of the middle ages for its wonderful virtues. Pliny says, that it was round, and remained unhurt in the fire, and that some called it *sideritis*. To this the later writers have added, that there are three kinds of it: the first round and black; this, rubbed over with oil of roses, was famous for the bites of venomous beasts. The second was green, variegated with veins and spots of white; this was to be annexed to the bodies of persons, to preserve them from many sorts of injuries. And the third was composed of parallel plates, and said to have the virtue of causing abortion, if only carried in the pocket.

ORITORIUS LAPIS, a name given by Ludovicus Dulcis, and some other authors, to the *ochroferreous stite*, or eagle stones; particularly to a species of them common in Germany, and used in the shops there, and in some other places, under the name of eagle stones. These are of a brownish colour and smooth surface, and are easily broken, being only composed of a thin crust of ferruginous earth, enclosing several small lumps of a greenish marle, which rattle in it when shaken.

ORIXA, in *Botany*, a genus of Thunberg's, whose name is of uncertain derivation. Schreber, on the authority of Dahl, suggests that it may possibly be the same plant as Thunberg's *Othera*. Thunb. Nov. Gen. 56. Fl. Japon. 3. Schreb. 82. App. 820. Willd. Sp. Pl. v. 1. 672. Juss. 425.—Class and order, *Tetrandria Monogynia*. Nat. Ord. uncertain.

Gen. Ch. Cal. Perianth inferior, of one leaf, four-cleft, very short. Cor. Petals four, lanceolate, spreading. Stam. Filaments four, shorter than the petals; anthers globose. Pist. Germen superior; style erect, shorter than the petals; stigma capitate, obtuse. Peric. unknown, but most probably a capsule.

Ess. Ch. Petals four, lanceolate, flat. Calyx four-cleft. Stigma capitate. Capsule?

1. *O. japonica*. Linn. Syst. Veg. ed. 14. 158. Thunb. Fl. Japon. 61.—Native of Japan. Stem shrubby, about six feet high, smooth, erect, branched. Branches alternate, smooth, the extreme ones hairy. Leaves alternate, stalked, ovate, undivided, green above, paler beneath. Flowers in alternate, greenish clusters, an inch long. Bractees concave, oblong, smooth, under the partial flower-stalks, which are hairy as well as the common stalk.

ORIZAVA, or ORISABA, in *Geography*, a town of Mexico, in the province of Tlascala, situated in a fertile valley, surrounded with detached mountains, overshadowed with the most verdant forests, containing a population of 3000 whites, and 1500 Indians and Negroes. The town is about 1500 fathoms in length, and 500 in breadth, with wide, neat, and well paved streets. Great quantities of tobacco are produced in the vicinity. It has some tanneries

and manufactures of cloth; 55 miles S.E. of Puebla de los Angeles. Orizava is on the high road between Vera Cruz and Mexico, being, according to Alcedo, 46 leagues to the east of the capital. In its vicinity is a volcano, which is regarded as the most majestic in the vice-royalty. D'Au-terroche observes, that the mountain Orizava is said to be the highest in Mexico; and its snowy capital is visible from the capital, a distance of 60 miles. This celebrated mountain is to the south-east of Mexico, not far from the road to Vera Cruz. It became volcanic in 1545, and continued for 20 years; since which time there has been no appearance of inflammation. Although the summit be clothed with perpetual snow, the sides are adorned with beautiful forests of cedars, pines, and other trees. Clavigero notices its conic form, which is observed at sea at the distance of 50 leagues. Some think it higher than the peak of Teneriffe. The detached mountains, called by the Mexicans Popocatepec and Iztaccihuatl, are also to the south-east of the capital, at the distance of about 30 miles, and are both volcanic. The crater of the former is said to be half a mile wide, and celebrated for ancient eruptions. Both are covered with perpetual snow.

ORIZEUS COLOR, a term used by authors to express the yellow colour of the eyes and urine of persons afflicted with a jaundice.

ORKEDAL, in *Geography*, a town of Norway, in the province of Drontheim; 18 miles S.W. of Drontheim.

ORKEL, a river of Norway, in the province of Drontheim, which runs into the bay of this name; 14 miles S.W. of Drontheim.

ORKENUD, a town of Sweden, in the province of Schonen; 24 miles N. of Christianstad.

ORKIANI, a town of Kurdistan; 36 miles E.N.E. of Erbil.

ORKNEY BEANS, in *Natural History*, a name given by authors to a sort of fruit found on the shores of the Orkney islands near Scotland. These are of several distinct species, and are none of them the produce of those islands, nor of any places thereabout, but are probably of American origin, many of them being plainly natives of Jamaica.

They are found principally on those coasts which are most exposed to the waves of the great ocean, and are on these plentiful, that they might be gathered in large quantities, if of any value; but the only use they are put to, is to making of snuff-boxes out of them. Sir Robert Sibbald, and Mr. Wallace, in their accounts of Scotland, have both named them under the title of Mollucca beans.

ORKNEY, or *Orkney Islands*, in *Geography*, a cluster of islands, situated in the northern ocean, between the coast of Caithness, the most northerly county of the main-land of Great Britain, and the Shetland isles, are distant from the former about four, and from the latter nearly twenty leagues. The latitude of the chief town, Kirkwall, is computed to be 59° 9' N., and the longitude 2° 30' W. from the meridian of Greenwich. From the force of the ocean, their form, as may be supposed, is extremely irregular. Their size also varies greatly; some of them being mere isolated rocks, incapable of human habitation; while others are several miles in circumference. Pomona, or the Mainland, extends above 30 miles in length from east to west, and discovers, throughout that space, a considerable degree of diversity in point of appearance, soil, culture, and elevation.

According to the most accurate surveys, the whole islands, composing this interesting group, are sixty-seven in number; twenty-eight of which are inhabited. The remaining thirty-nine are denominated holms, and are appropriated to pasturage, during the summer months. The names of the inhabited

inhabited islands are Pomona or the Mainland, Graemfay, Hoy, Waas, Ruffay or Riffay, Farray, Cavay, Flotay, South Ronaldfay, Swannay or Swinna, Pentland, Skerry, Burray, Lamor or Lambholm, Copinfay, Shapinfay, Stronfay, Papay-Stronfay, Eday, Faray, Sanday, North Ronaldfay, Weftray, Papay-Weftray, Eagleshay, Roufay, Weir, Enhallow, Gainfay, and Damfay. The chief of these will be found described under their respective appellations, in preceding or fubfequent pages of this work.

History.—The period at which the Orkney islands were firft made known to the civilized world is not recorded in the works of any ancient author. Dr. Barry, however, deems it more than probable that they were discovered by the Carthaginians, or by the fpirited Greek colony at Marfeilles, feveral centuries previous to the Chriftian era. But whether they were inhabited at that time, is a queftion which the fame writer admits it to be impoffible to determine; though he is of opinion that they were, and thinks it moft likely that the original inhabitants came hither from the north of Scotland. At all events, there is no doubt of their having been known to the later Greeks, and to the Romans. Herodotus mentions Britain in general. Diodorus Siculus takes notice of Scotland in particular, mentioning cape Orcus, or Dunnet, the moft northern promontory of Caithnefs, from which thefe islands can be diftinctly feen; and Pomponius Mela points them out under the name of Orcades, which is to this day their Latin appellation. Buchanan and fome other authors mention the names of feveral kings, who reigned over thefe islands during the firft five centuries of the Chriftian era. And in the divifion of the Roman empire among the fons of Conftantine, the Orcades are claffed with Britain, Gaul, and Spain, in the enumeration of thofe countries which fell to the lot of young Conftantine.

Thefe circumftances tend ftrongly to fhew that the Orkneys were formerly confidered as an ancient kingdom; but of their hiftory throughout this period, nothing can be affirmed with certainty, except that they were inhabited by the fame race of people, who, under the denomination of Picts, occupied the whole eaftern coaft of Scotland, forming two diftinct monarchies, feparated from each other by the Grampian hills. To the more northern of thefe fovereignties the islands were tributary, in the eighth and ninth centuries. Towards the clofe of the latter, however, they were reduced under the dominion of Norway, by Harold Harfager, who likewife fubdued the weftern islands and the Ifle of Man. This prince conferred the hereditary government of his new conquests on Ronald, count of Merca; but that nobleman immediately refigned them in favour of his brother Sigurd, whom the king, at the fame time, created earl of Orkney.

By the nature of this grant, Sigurd, though tributary to the king of Norway, was in effect as independent as any fovereign prince, and could levy troops and make war at his own pleafure. Accordingly he turned his arms againft Scotland, and reduced under his fway the whole of Caithnefs and Sutherland. This earl was fucceeded by his fon Gottorm, who dying without iffue, the earldom reverted to his uncle Ronald, by whom it was given to Hallad, one of his own fons. His government was marked with timidity and weaknefs. Instead of exerting himfelf to repel the inroads of the numerous pirates who infefed the islands, he fhut himfelf up in one of his caftles, and at length abdicated the government, and returned to Norway. Einar, his brother, now obtained the earldom. The adminiftration of this earl was as vigorous and wife as that of his predecessor had been weak and impolitic. He introduced many improvements into the islands, and not only freed them from

piratical invafion, but, throwing off the Norwegian yoke, on account of the murder of his father, rendered himfelf independent of that kingdom. Sigurd left three fons, the two eldeft of whom were flain in battle, fhortly after their father's death; fo that the earldom devolved upon Thorfin, the youngelt. This earl lived in peace during his whole life; but after his death, the islands were diftracted by the contentions of his fons. At length the death of the others gave the undisputed poffeffion of the earldom to Landver, who married the celebrated Audna, daughter of Kiawala, one of the kings of Ireland. By this princefs he had one fon, Sigurd, his fucceffor, who was one of the moft illuftrious men of his age. He fell in battle at Clontarf, near Dublin, and was eventually fucceeded by his youngelt fon Morfin, who maintained the glory of his father's name. He left two fons, Paul and Erlend, who lived in the utmoft cordiality, till their friendship was difturbed by the ambition of Hacon, the fon of Paul. This young nobleman went over to Norway, where, as well as in Sweden, he acquired great military reputation. During his refidence in the former country, he reprefented to king Magnus the advantages which would accrue from a weftern expedition. That prince accordingly failed for Orkney, and difpoffeffing the two earls, appointed one of his own fons viceroy in their ftead. He then made excurfions into Scotland, Ireland, and England, accompanied by Hacon, and his two coufins, Erlend and Magnus. This laft was highly diftinguifhed for his learning and piety, which fo much excited the envy of Hacon, that he caufed him to be murdered. Soon after he obtained the earldom. Hacon had two fons, Paul the Silent and Harold the Orator. The latter fucceeded in Caithnefs, and the Orkneys were governed by Paul, till the deceafe of the former, by his own imprudence, gave the entire fovereignty to Paul. Another competitor for the earldom, however, foon after appeared. This was Ronald, the nephew of the murdered Magnus, who, after a long ftruggle, fucceeded in obtaining poffeffion of the islands, and built the noble cathedral of St. Magnus, his uncle having been previously canonized by the pope. But Ronald did not long continue fole mafter of the islands, being induced by motives both of policy and juftice to take young Harold, the heir of Paul, as a partner in the earldom. Thefe noblemen lived amicably together, but found great difficulty in maintaining their poffeffions againft other pretenders. At length, however, Harold, who furvived Ronald many years, rendered himfelf fo powerful, as to be able to levy war againft the king of Scotland, and to wrefte Caithnefs once more from that monarchy. Harold died in the 73d year of his age, and with him ended the independent fovereignty of the Orkneys; for though feveral earls of the Norwegian race governed after him, they were completely under the controul of the fovereigns of Norway.

The laft refident earl of Orkney was Magnus V., at whole death, in 1379, the male line became extinct, and Henry Sinclair of the family of Strathearn, a defcendant by the female line, fucceeded to the title. Caithnefs and Sutherland were now alienated for ever to the crown of Scotland; and the kings of that country foon after claimed the fovereignty of the islands alfo. This, however, they did not obtain till the reign of James III., who having married a daughter of Eric, king of Denmark, Orkney and Shetland were pledged in payment of her dowry, which was never paid; and confequently both thefe clufters of islands have, fince that period, formed a part of the Scottifh monarchy, and followed its deftiny. The earls, however, retained for fome time longer many of the high privileges annexed to their ftation; but thefe alfo, and even the title,

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were eventually renounced, in exchange for other possessions and honours. Queen Mary attempted to confer these islands, with the title of duke, on her favourite the earl of Bothwell, when she intended to marry him. James VI. gave them to Patrick Stewart, at whose attainder they again reverted to the crown, and were afterwards granted to the earl of Morton. In this family they continued till the year 1766, at which time they were sold to the father of their present proprietor, lord Dundas.

Geology and Mineralogy.—The eastern coast of the islands is low, and generally flat. As the shore advances to the west, the land is so elevated, as, with a few interruptions, to form itself into a range of hills, the highest of which is about 1200 feet in perpendicular height from the surface of the sea. The shores in this quarter are bold and steep, and present many scenes truly sublime. In some places they remain entire; but in others, having yielded to the force of the ocean, and the ravages of time, they appear shattered into a thousand pieces, formed into majestic arches, or hollowed out into dark and unfathomable caverns. From the disposition of the strata, and many other considerations, little doubt can be entertained but that these islands, in remote times, were connected with each other, and also with the main-land of Scotland.

Both in the islands to the north of Pomona, and in those south from it, the strata consist chiefly of sand-stone, sand-stone flag, schistose, clay, and lime-stone, together with some mixture of basalt and breccia. The sand-stone, which is very plentiful, is in some places red, and in others of a dirty grey colour. The lime-stone and basalt generally lie under a stratum of sand-stone; and so little metallic ore does this group afford, that almost the only veins of any consequence, hitherto discovered, are two of lead in the island of Shapinsay, and some iron-stone in Hoy. The strata of the main-land are similar to those in the other islands; but it likewise contains some slate, granite, marble, and alabaster, and is more abundantly supplied with metallic ores. A large rock, of rather singular character, stands at the western entrance of the Pentland frith. The ground of this rock is of various colours; brown, red, grey, white, yellow, and greenish. Small rounded pebbles, generally quartz, of a white colour, are disseminated through it; and fragments of granite and other stones are immersed in it, in various places. Veins and detached nodules of white calcareous spar are likewise frequent. In some parts it is rudely stratified, but in general is a shapeless mass or blotch. Being susceptible of a fine polish, cups, vases, and ornamental trinkets, are formed from it.

Soil and Climate.—The soil of the Orkney islands is more various, probably, than in any other district of Great Britain; and these varieties are so intermixed, that scarcely a single farm is in this respect uniform. All the soils are thin or shallow, being seldom more than one or two feet deep; but they are nevertheless uncommonly fertile. The rocks upon which the soil rests, and which in many places are so soft and friable as to break before the plough, appear by their decomposition to prove favourable to vegetation, or to afford food for plants.

Though situated so much to the north, the climate of these islands is not liable to those extremes of heat and cold, which prevail in continental countries, less distant from the equator. This fact is the result of the proximity of every part of them to the ocean. The medium temperature, as appears by the springs, amounts to 45°; and the whole range, between the lowest point of cold in winter and the highest of heat in summer, is from 25 to 75° of Fahrenheit's thermometer. The most prevalent winds here blow from

the south-west and south-east, in the spring, summer, and harvest months; but during the rest of the year, northerly winds are most frequent. Calms seldom occur for any length of time; and the winds, from whatever quarter they blow, or in whatever season, are scarcely ever tempestuous, though often loud and strong; a circumstance which contributes greatly to the salubrity of the atmosphere. Rains fall here in considerable quantity, and more on the western than on the eastern coast. Snows are neither frequent nor of long duration; but they come with uncommon violence, and generally from the north-west and south-east quarter of the heavens. One peculiarity with respect to this subject is, that snow and hail are very prevalent for about a fortnight in the month of June. They are accompanied by a strong piercing wind from the north, which, destroying the buds and their blossoms, checks the progress of vegetation, and clothes the fields with the appearance of approaching winter. The cause of this extreme and seemingly unnatural cold is the dissolving of the immense fields of ice, in the northern ocean, happening at this season, and the consequent absorption of heat, occasioned by the change of that body from the solid to the fluid state. About 50 years ago, the inhabitants were thrown into great alarm, by the fall of what was termed black snow, during this period. The phenomenon, however, was soon afterwards explained, and their fears allayed, by an account of an eruption of mount Hecla, in Iceland, having taken place on the day previous, which no doubt was the source whence the snow derived its unusual hue. Those who may be inclined to doubt this view of the fact, on account of the distance, will do well to consult Buffon (Natural History), who distinctly states, that in some of the eruptions of mount *Ætna*, or *Vesuvius*, the ashes have been carried by the winds to the shores of Egypt.

Another striking peculiarity in the climate of these islands is, that thunder and lightning, the usual concomitants of hot and sultry weather, are seldom observed here in summer; but, in direct contradiction to the apparently general law of nature, are common in winter, and then only when the elements are in commotion. To what cause this anomaly ought properly to be referred, is yet a question of uncertainty among natural philosophers. Experience, however, has sufficiently testified that their appearance in the cold season has no effect in rendering them either more violent or destructive than in other parts of the globe. They are not accompanied by hail-stones of such magnitude, nor have they such a tremendous glare, nor such loud and awful peals, as in more southern climates.

From the proximity of these islands to the north pole, the days here in summer are of extreme length, but those of winter are short in proportion. The long absence of the sun, however, throughout this season, is in some measure compensated by the great lustre of the moon, during her periods of shining, and by the scarcely less transcendent brilliancy of the *aurora-borealis*, which arises almost every unclouded night in the harvest, winter, and spring months, and is of incalculable advantage to the navigation of those seas, which are perilous only when want of light renders it impossible for the seamen to ascertain the position of their numerous rocks, or to enter one of the excellent harbours with which almost every island abounds. For some account of this phenomenon, see *AURORA-BOREALIS*.

Tenure of Lands.—Landed property in Orkney is held in a variety of forms, which may, however, be generally reduced to three: crown-lands, church-lands, and udal-lands. The first were anciently the private property of the earls, but came in the course of time to be feued out, or granted

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in perpetuity to vassals, who are bound to pay for ever the old rents. The church-lands are those which formerly belonged to the bishops and clergy, and which are now held by individuals, whose ancestors had obtained them in feu or perpetuity, for payment in kind of the original rents. The udal-lands are those possessed without any written charters. This tenure occurs also in Shetland, and in the town of Lochmaben. Hence it would appear that the feudal system had never fully penetrated to these islands. The uallars, however, are comparatively few in number: some of them pay a trifling rent to the crown or church, but many pay to neither. Several of the larger, and many of the smaller, proprietors cultivate their own grounds; but the far greater proportion of the lands is let out to tenants; the larger farms on leases of seven, fourteen, or nineteen years, and the lesser ones usually at will. The size of farms in tillage varies from two acres to two hundred: an average size may be about eight acres in cultivation to each farm.

Agriculture.—The great irregularity of form discernible in these islands renders it almost impossible to compute the number of square miles, or of acres they may contain. An attempt to effect this object has been made, however, by Templeman; according to whom, the whole group comprises 384,000 English acres, of which only 24,000 are arable, and 60,000 laid down in pasture. The remainder is occupied by heath, and moss, and by houses, walls, roads, water, &c.

The usual grains cultivated in the Orkneys are grey oats and bigg or bear; and these in alternate crops, without intermission. Fallowing is very sparingly practised by the larger farmers, but not at all by the smaller ones. A few acres of turnips are sown annually; and from the abundance of the produce, the ground and climate would seem to be peculiarly adapted to that crop. The manure in ordinary use is seaweed. Lime and marle, though sufficiently abundant, and easy of access, are scarcely ever used; and even the dung of animals is neglected, in comparison of their favourite seaweed. Draining is a custom totally unknown. In short, neither the science nor the practice of agriculture is yet understood in this part of the British empire; nor is it probable that much improvement will take place, so long as the payment of rents and duties is managed on the present system. In a country so situated as the Orkneys, the farmer has obstacles enough to combat of a physical nature, and requires more than ordinary incentives to vigorous exertion. To clog him, therefore, with civil burdens, is to extinguish every feeling of which industry is the result.

The instruments made use of here for agricultural purposes are lamentably deficient. The same plough, which was formerly universal, is still common. It has only one tilt, without either wrest or mould-board; and its other parts are joined in such a form, that it does not possess a single quality to recommend it but its simplicity, and the low price at which it can be purchased. This awkward tool is drawn by three or four small horses abreast, with the driver moving backwards before them. The harrows are very small and light, and often have wooden teeth, even where the soil is strongest. The roller is little known, being used only by a few of the great farmers. For some further remarks on the agriculture of these islands, see POMONA.

Botany.—To enumerate all the indigenous plants, which have been observed in the Orkneys, would far exceed the limits allotted to an article of this kind. Those usually raised for convenience, or ornament, differ little from such as are met with in similar situations, in other parts of Scotland. Bear or bigg and oats are the kinds of grain most

commonly cultivated; but to these, though in very sparing quantities, are sometimes added pease, beans, wheat, rye, and flax, on the grounds of the more enterprising gentlemen farmers. The same description of persons likewise raise tares, saintfoin, lucern, cabbage, turnips, and different sorts of clover and rye-grass. In the flower-garden, the rose, the tulip, the carnation, the pink, and a multitude of other flowers, are cultivated with success; and the kitchen-garden produces cabbage, brocoli, cauliflower, pease, beans, spinage, leeks, onions, turnips, carrots, parsnips, celery, and artichokes. The fruit-garden affords excellent black, white, and red currants: the other fruits, however, are very inferior both with respect to size and flavour. Of trees there are only a few in Hoy; and these, on account of their stunted growth, scarcely deserve the name: and some of larger dimensions in the gardens around Kirkwall. This fact would excite little surprize, if the most unequivocal evidence of their former existence here, in great plenty, were not derived from history, and from the number of trunks dug up in the mosses. The opinion so commonly entertained, that trees will not grow in the Orkneys, is completely erroneous. When proper attention is paid to the early growth of the young shoots, its fallacy will soon become manifest. The failure of the attempts hitherto made has been the consequence of neglect, or of the want of judgment in planting in situations too much exposed to the violence of the weather, or of the sea spray.

Zoology.—The quadrupeds of these islands are the horse, the ox, the sheep, the hog, the dog, the cat, the otter, the shrew-mouse, the mole-mouse, the field-mouse, the Norwegian rat, the rabbit, and the seal. The horse is precisely similar in appearance and qualities to that of Shetland. (See MAINLAND OF SHETLAND.) The ox is of a very singular breed, and altogether different from any kind known in other parts of Great Britain. This animal is of a very diminutive size, but strong and hardy; and is supposed to have originally come from the Scandinavian shores. The sheep is likewise a peculiar breed, and, from some features in its character, appears to be sprung from the same stock with that of Iceland, the Ferroe, and Shetland. It is reared entirely in a wild state, and hence is extremely small; the whole carcass seldom weighing more than 36 pounds. The hog is very different from the ordinary species bred in Scotland. Its back is highly arched, and covered with a great quantity of long, stiff bristles; the ears erect and sharp pointed, and the nose amazingly strong. The hair of this animal is an article of considerable value: it serves as an excellent substitute for hemp, in making ropes to anchor fishing-boats.

The brown or Norwegian rat has been introduced by the shipping that frequents the islands, and has nearly banished the common black rat. From the tip of the nose to the point of the tail it measures about 18 inches. This animal displays great fierceness, and has even been known to brave the attack of man. Rabbits are so abundant here, that their skins form a considerable branch of commerce. Their colour is usually brown; an entirely white one is seldom seen. Though devoured by various animals of prey, the stock never seems to suffer any diminution. The case, however, is very different with the hare, which was formerly an inhabitant of the Orkneys, but has entirely disappeared within the last two centuries. Seals are common in all the small islands, or holms, and are valuable for their skins and oil. Hams, made of young seals, are much relished by the natives.

The domestic birds are dung-hill fowl, ducks, geese, turkeys, and a few peacocks. The wild birds consist of an immense

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immense variety of land and sea-fowls, both migratory and indigenous. In ornithology, indeed, the Orkneys constitute the most interesting district in the British isles. It is the general breeding-place of our native water birds; and in the towering cliffs and precipices of many of the isles are numbers of eagles, falcons, and owls. Swans also are abundant, during winter, in the fresh-water lakes. Mr. Bullock, the proprietor of the London Museum, has lately enriched his valuable collection by many beautiful and rare specimens from these remote islands, where he spent a great part of the summer of 1812. In the awful cliff he found every species of British eagle, except the osprey; and brought away several of the young birds, as well as those of the peregrine falcon. The great northern diver frequents the bays of this isle; and those rare British birds, the red-throated diver and the arctic gull, breed on the edges of the fresh-water lakes. In North Ronaldsay the gentleman above mentioned discovered, and added to the British Fauna, the majestic strix nyctea, or great snowy owl of Hudson's Bay. In the marshes of Sanda he found the nest of the beautiful little red phalarope. The great black-backed gull breeds in the Souliiskerry, a low flat isle situated 10 leagues from Hoy. Here were seen such myriads of birds, that they darkened the air; and it was difficult to walk, without destroying their eggs. In the small holm of Papay-Westray were discovered the king-duck, the eider-duck, so valuable for its down, and the only specimen of the great auk Mr. Bullock ever saw on the British shores. Grouse are common in all the mountainous isles, but partridges are unknown. The stormy petrel, or Mother Carey's chick, breeds in the rabbit-holes on several of the isles. The peregrine is discovered on head-lands and inaccessible precipices: never more than one pair and their offspring inhabit the same rock; and as soon as the young ones have acquired sufficient strength, they also are driven away by their parents to seek new places of habitation for themselves. When falconry was in vogue, this noble kind of hawk was frequently carried hence for the amusement of the Scottish monarchs. In such estimation, indeed, was it held, that when the earldom was disannexed from the crown by act of parliament, all hawks were reserved to his majesty, with the falconer's salaries; and accordingly, even at this day, a hen from every house here is paid annually to the royal falconer.

Among the eagles which abound in Orkney, the species called the ring-tail eagle is most remarkable. It is distinguished from the other kinds, by a band of white encompassing the root of the tail, and by the feathers covering its legs to the very feet. This bird is so prodigiously strong, that he has been known to carry off, not only large fowls, but lambs, pigs, and even children. So great was the devastation committed by him in ancient times, that a law was passed, assigning a considerable reward to any person who destroyed a nest, or one of the birds. In the exhibition of the Royal Academy of London, 1813, was a very fine and interesting picture, from the pencil of G. Dawe, A.R.A., representing a mother rescuing an infant child from the nest of one of these eagles.

The dexterity of the natives in catching the various kinds of aquatic fowls is surprising, and the attempt is apparently fraught with the utmost danger. Sometimes an individual is lowered down by a rope, from the summit of a precipice, to the place where the birds nestle. At other times, one party proceeds in a boat to the foot of a rock, while another is stationed on the top. Those on the summit are provided with two ropes, which are thrown down to their comrades in the boat, who fasten them to the upper corners of a large

net. The net is then hoisted up, so as to cover the rock on which the birds are sitting; and as soon as this has been effected, a noise is made with a rattle by the boatmen below. The fowls, terrified at the sound, fly into the bosom of the net, in which they are instantly inclosed, and lowered down into the boat.

The marine animals, which haunt the coast of these islands, are no less various than the birds which frequent their rocks. Lobsters and crabs are discovered in great abundance. Of the former fish, many thousands are shipped for the London market every week. The coal, cod-fish, and haddock, are plentiful, and so likewise are herrings; but notwithstanding the great advantage which might accrue from these fisheries, very little attention is paid to this species of industry. Skates are found here from one to five feet in diameter. The grampus is seen in great numbers in most of these coasts, and particularly in strong and impetuous currents. The size of these animals is from fifteen to twenty-five feet in length, and they are very thick in proportion. Its appetite is so voracious, and its nature so fierce, that it will attack the largest fishes. The spermaceti whale, the bottle-nose, and the round-lipped whale, are very frequently thrown on shore in these islands; a circumstance supposed to be occasioned by the attacks of the grampus. Herds of porpoises to the amount of a hundred and upwards are often seen together.

Natural Curiosities.—Among the curiosities of Orkney, the stupendous arches, and immense caverns formed by the ocean, are the most prominent, and cannot fail to attract the notice and excite the surprise of all who are strangers to such scenes. The Old-man-of-Hoy is probably as remarkable a monument of its kind as any in the universe. It rises boldly from the sea to the height of 1500 feet, and exhibits a perpendicular section of the sand-stone strata, built upon each other with all the regularity of architecture. In some aspects it resembles a rude pyramid, whose base has been narrowed by the waves; in others, it bears a striking similitude to the ruins of a vast cathedral, or of a turreted castle. Near the summit of this hill, in the summer months, something is observed to shine and sparkle with uncommon lustre. The natives regard it as an enchanted carbuncle; and it is curious, that, though many persons have clambered up the rock to ascertain the occasion of this appearance, they have hitherto failed in their object.

On the shores here are found a great number and variety of curious marine shells, and many strange fishes, driven hither by the currents of the ocean. But the greatest curiosity thrown by the sea on these islands are the phaseoli, commonly known by the name of the Molucca or Orkney beans. They are of several species, none of which are the produce of a northern climate, but are probably of American or West Indian origin; many of them being natives of Jamaica. They are found chiefly on the western coasts, and are on these so plentiful, that they might be gathered in large quantities, if of any value; but the only use they are adopted for is the making of snuff-boxes. See *ORKNEY Beans*.

Exotic birds, the inhabitants of distant and warm climates, occasionally visit these islands; whither they have been doubtless forced by tempestuous weather. A Laplander, from the same cause, is sometimes seen here, in his slender canoe, covered with skins. Fish, as large as whittings, are frequently thrown ashore to a considerable distance within the land; and at Cantick Head, such is the force of the meeting tides, that, in stormy weather, huge stones are often heaved up from the bowels of the deep, and cast over the rocks upon the shore.

Ancient and present State of Religion.—Previous to the Norwegianian

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wegian invasion, the inhabitants of Orkney appear to have been worshippers of the sun, and to have had Druids for their priests. That event, however, brought along with it the barbarous superstition of the north, or the worship of Odin. This god was supposed to delight in bloodshed and war; and those who fell in battle were deemed so many victims on his altars. Death in action was the surest passport to his paradise, the pleasures of which consisted of indulging in immortal drunkenness, accompanied with the triumph of victory, or of drinking ale to all eternity out of the skulls of an enemy.

To this horrid worship succeeded the milder doctrines of Christianity, towards the end of the tenth century, when Sigurd was in possession of the earldom. The manner in which its establishment was effected affords a singular view of the manners of the age, and of the zeal with which that religion was propagated. Olaus Frigueson, who then filled the throne of Norway, having been converted while in England, and perceiving the superior excellence of the Christian creed and precepts, became inspired with the most earnest desire of converting others. For this purpose, accordingly, he visited Ireland; and on his return, brought his fleet to anchor in one of the harbours of South Ronaldsay, and sent an invitation to Sigurd and his son to come on board his ship. The earl suspecting no treachery, and confident in his acknowledged fame and power, instantly complied, imagining that the king wished to hold a conference with him respecting some military enterprise. He was soon, however, undeceived, by Olaus telling him the object of his expedition, and declaring, that unless he and his people would immediately embrace the Christian faith, he would desolate his country, and put every heretic to death. Sigurd, though confounded at this unexpected threat, nevertheless answered with firmness, that he could not suffer himself to renounce his religion, sanctioned as it was by the wisdom of his ancestors, until some sufficient reasons were offered why he should be guilty of such abjuration. The Norwegian monarch replied by seizing the son of the earl, and swearing he would plunge his sword into his breast, if his father continued obstinate: whereupon Sigurd agreed to his proposals, and publicly professed himself a Christian. His example was followed shortly after by all the people; and, from that period, Christianity constituted the religion of the Orkneys, which, with Shetland, ever after formed one bishopric. Some of the prelates who filled this see were men distinguished, not only as divines, but as eminent literary and political characters. Among the more celebrated of them were Robert Reid and Adam Bothwell. The former held some of the highest offices in Scotland, and was one of the commissioners sent to witness the marriage of Mary, queen of Scots, with the dauphin of France. He left by will 8000 marks, for the purpose of founding a college in Edinburgh. Adam Bothwell, his successor, was the first episcopal bishop of the isles. This prelate performed the marriage ceremony between queen Mary and Bothwell; and also inaugurated her son, king James, after she was compelled to resign her crown. By his assistance the Scotch laws were first collected into a body, and published; and when the unhappy differences occurred between the young king and his mother, during her imprisonment in England, he was chosen by the estates to aid the regent in bringing them to a termination.

So long as the Catholic and episcopal form of church government continued in these islands, eighteen ordinary officiating clergymen were stationed here. The same number was employed after the establishment of presbyterianism; most of whom had, as their successors still have, two or even

three churches to occupy, frequently situated at considerable distances from each other, and separated by branches of the sea. Notwithstanding this, however, divine service is said to be performed in all of them with becoming regularity. For some time subsequent to the change of religion, the whole clergy were united into one presbytery; but they afterwards divided into two, and now form three presbyteries, consisting of six ministers each; the whole composing a provincial synod. The three presbyteries choose each three members, and the borough one, to represent them in the general assembly. Lord Dundas is patron of all the parishes both of Orkney and of Shetland.

Civil Government.—Before the transfer of the Orkneys to the crown of Scotland, the inhabitants were governed by the laws, and adhered to the customs of Norway. Indeed, for a long period after they changed their masters, these islands still retained the same political constitution as before. The supreme court, called in the language of the country lawting, continued in the exercise of its legislative powers so late even as the time of the commonwealth, when it was entirely abolished. The acts passed in this assembly, which are still known under the name of county acts, are said by Mr. Barry to discover much regard to the prosperity of the place, as police regulations, though lamentably defective on the subject of trade and commerce. The constitution of the lawting is supposed to have resembled, in some degree, that of the tyndal-court, or house-of-keys, in the Isle of Man. The president, or principal person of this court, was named the great foud, or lagman; and subordinate to him were several little fouds, or under-sheriffs or bailiffs: and as the chief judge had a council, consisting of several members, called raddmen; so the inferior ones had their council also, composed of members denominated lagraetmen, or law-wrightmen, who were a kind of constables for the execution of justice in the respective islands. To these members were added, at least latterly, the governors for the time, the gentlemen of the county, and even a certain number of the peasantry, who, among a free people, claimed a vote in framing the laws that were to govern them.

The legislative enactments of the lawting have for many years totally fallen into disuse, and the decisions of all the courts are now regulated by the principles and practice of the law of Scotland. Lord Dundas, as high steward or lord lieutenant of the county, which includes both the Orkney and the Shetland isles, has the power of nominating certain judges called bailies, one of whom is established in every island and parish. These petty magistrates act as justices of the peace, and hold courts for the decision of civil pleas to the value of 16s. 8d. sterling. All questions of higher import must be pleaded in the sheriff's court, which is held at Kirkwall, usually by the sheriff-substitute; the sheriff-depute, who is always a Scotch barrister, and appointed by the crown, only visiting his jurisdiction occasionally, to determine such causes as may chance to involve more difficult and abstruse points of law. Subservient to the bailies are six or seven of the more respectable inhabitants, who act as constables, and superintend the morals of the other parishioners. In Kirkwall, which is the seat of justice, there are, besides the sheriff's court, a commissary, a justice of the peace, and admiralty court. The commissary court is appropriated to pleas of an ecclesiastical nature, such as divorces, marriages, &c. See SCOTLAND.

Towns, Representation, &c.—The only towns or villages of any consequence in the Orkney islands are Kirkwall and Stromness. Both these places are situated on the Mainland, and are supposed to contain nearly 3000 inhabitants each. The former is a royal burgh, and the capital of the county; but

but Stromness is merely a village, though it probably carries on more trade than Kirkwall. See KIRKWALL and STROMNESS.

The county is represented in the British parliament by one knight of the shire; and the burgh, in conjunction with four others, make choice of a burgoess, who is likewise considered as the representative of the inhabitants at large. Lord Dundas, as may be supposed, possesses the chief interest both in the county and burgh.

Population.—As there are no authentic data, by which the ancient population of these islands can be accurately ascertained, the conjectures which have been hazarded on this subject afford very different results. When, however, the power of the earls, and the anxiety with which their alliance was courted, are taken into view, it seems reasonable to conclude that it must have been very considerable. In a general muster of the people by P. Stewart, earl of Orkney, it is said that 10,000 men could be raised on any emergency, and as many left as were sufficient for the agriculture and fisheries. Guthrie, in his History of Scotland, asserts that the same amount of persons from this country carried arms, at the time of the great rebellion, in the 17th century. These representations, if admitted to be correct, would seem to swell the population beyond the bounds of probability. Dr. Barry, therefore, considers them as extravagant. It is certainly evident, however, that the population of the Orkneys has suffered a great decrease within the last century; and no less clear, that the islands are capable of supporting four times the amount of their present inhabitants, which, according to the parliamentary returns of 1811, were computed at 23,238 in number.

Manufactures and Commerce.—At the commencement of the last century, a very considerable manufacture of woollens is said to have been carried on in these islands. This branch of industry is now much decreased, and confined entirely to a home consumption. The articles manufactured are chiefly stockings and blankets, and a very coarse kind of cloth worn by children, and by those resident in the country; for the inhabitants of the town almost universally wear English cloth. The linen manufacture was introduced about sixty years ago; and though at first it met with an unfavourable reception, it soon triumphed over every opposition, and became very widely diffused, to the great benefit both of the manufacturers and of the labouring poor; many of whom must have perished for want, but for the timely support it was the means of supplying. This improving condition of affairs continued for upwards of twenty years, when the manufacture suffered a temporary decline, by a competition among the manufacturers, occasioning an undue rise of wages, which seldom fails to be attended with a proportionate diminution of industry among an indolent people. The natural course of events has happily, however, corrected this evil; and the linen manufacture is now more extensive, and better conducted, than at any former period. The quantity of linen cloth stamped annually exceeds 60,000 yards; and the amount of yarn sold in the same space, to the merchants of Newcastle, Edinburgh, and Glasgow, and to itinerant purchasers, is estimated at considerably above 100,000 spindles. Almost all the flax consumed is imported from Russia and Holland.

But the principal and most lucrative manufacture of the Orkney islands is that of *kelp*. This substance is chiefly valuable on account of the large quantity of soda it contains, which renders it useful in the composition of soap; in the manufacture of alum, and in the formation of crown and bottle glass; indeed in these manufactures kelp answers completely all the purposes of the very best potash. It is formed

by burning certain species of marine plants; and affords employment to about three thousand persons of both sexes during the summer months. Each of them makes in that period a ton, consisting of 24 cwt. of kelp, for which they receive, according to circumstances, from 30s. to 3l., so that the total quantity made every season is somewhere about 3000 tons. The price at which it is sold to dealers in the south, varies from 8l. to 10l. *per* ton, including the expence of freights, insurance, &c. which are mostly effected by natives. Hence the profits accruing to the islands from this manufacture are calculated on an average at 25,000l. *per annum*. For some account of the process of making kelp, see CARBONAT of Soda.

The Orkneys, from their situation, and from the excellence of their harbours, are certainly well calculated for a commercial connection, not only with the different trading towns of Great Britain, but with the north of Europe, and with America. Such a connection, however, cannot possibly subsist to any considerable extent, until an important amelioration of their agricultural and manufacturing condition takes place; and this, we fear, is not soon to be expected. Nevertheless, it is pleasing to observe that the limited trade these islands possess is in a progressive state of improvement. The principal exports are beef, pork, butter, tallow, hides, calf skins, rabbit skins, salt fish, feathers, linen, yarn, and coarse linen cloth and kelp; and, in favourable seasons, corn, meal, and malt. The imports are wood, iron, flax, coal, sugar, spirits, wines, snuff, tobacco, flour, and biscuit, soap, leather, hard ware, broad cloth, and printed linens, and cottons. In 1790 the exports were valued at 26,598l. 12s. 0d. and the imports at 20,803l. 0s. 0d. prime cost in the English and Scotch markets; but in 1800 the exports were stated at 39,677l. 9s. 4d. and the imports at 35,789l. 17s. 4d.

Obstacles to Improvement, Weights, &c.—The chief obstacle to the improvement and value of these islands, is the necessity the farmers are under of paying their rents in kind, and principally in grain. Hence it arises that the latter produce must either be raised on grounds which are far better adapted for the cultivation of grafs or green crops, than of corn; or the farmer must commute at a rate which renders his rent extravagant, and such as wholly precludes him from realizing a reasonable profit for his labour. This rate is the price brought by the best foreign grain, loaded as it is with freight charges and mercantile emoluments. To remedy this serious evil, which is alike prejudicial to agriculture, manufactures, and commerce, the intervention of the legislature is indispensably requisite, as otherwise it is impossible to compel a fair conversion of the rents into money.

The weighing instruments of Orkney are likewise among the grievances which obstruct the improvement of this territory. These were brought from Norway at a very early period, and not only differ from those in use on the Mainland, but the original standards being lost or destroyed, are themselves fluctuating, and in some measure arbitrary. These instruments are called the *byfmer* and *pundler*. The first consists of a lever, or beam of wood, three feet long, and about three inches diameter from one end to near the middle, whence it tapers gently to the other end, which is not above one inch in diameter. From the middle, all along this small end, iron pins are fixed at unequal distances, which serve to point out the weight of the body weighed. The *pundler* is so nearly similar in form to the *Statera-Romana*, or Steelyard, as to supersede any further description, than merely to observe that the beam of which it is composed is about seven feet long, and between three and four inches in diameter. This instrument is employed in weighing malt, meal, beer, oats, and other gross commodities; while the *byfmer* is made use

use of for ascertaining the weight of butter, oil, falt, wool, cheefe, and such other articles as are commonly purchased in smaller quantities. The lowest denomination of weight is the mark, twenty-four marks make a settepen or lispund, the highest quantity weighed by the byfmer, fix settepens, a meil, and twenty-four meils a laft. So intricate are these weights, and such the uncertainty that attends them, that even the natives, most accustomed to weighing, find great inconvenience arising from the use of them, and differ materially concerning the exact weight of each denomination. Some contend that the mark, which is the radical weight of which all the rest are multiples, should weigh eighteen ounces, while others assert it should weigh twenty-two. The latter, however, is the most just, as well as the most prevalent opinion; of consequence the settepen, or lispund, should contain thirty pounds, and the meil eleven stone four pounds, Amsterdam weight.

Language, Manners, and Customs—The ancient language of Orkney was derived from the Gothic, which generally spread itself over Germany and Scandinavia. It was called the Norfe, but seems to have been a distinct dialect from that spoken either in Denmark, Sweden, or Norway, though it had a much greater similitude to the last than to the others; but whether this difference was the result of chance and time, or was owing to a mixture of the old Pictish language, are questions of no easy solution. Such as it was, however, it continued to be spoken in great purity for two centuries after the islands became annexed to the crown of Scotland. Some persons were even to be found who could speak it with perfect ease within these fifty years back. At present it is only to be traced in the names of places and persons; the English language, with a Norwegian accent, and a great mixture of Scottish terms and phrases, having become the common language of all the islands.

The manners of the gentry in this country differ very little from those of the same class in Edinburgh, where indeed they most frequently receive their education, and imbibe those habits and feelings, which are seldom obliterated under any circumstances of human life. They are generally kind without caressing, civil without ceremony, and respectful without compliment; they are obliging and hospitable to strangers, and when no party differences interfere, (which are unhappily too frequent,) social and friendly among themselves. Dr. Barry characterises them as distinguished for their good sense and literary acquirements, but blames them much for their supine indifference on the subject of religion, in which respect, however, the same author observes, they differ entirely from their female companions, whom he holds up as models of innocence, industry, and economy, and no less alive to the tender sensibility that adorns their sex, than superior in understanding and personal attractions.

The second class of persons, consisting of those denominated tradesmen and shopkeepers, reside mostly in the two principal towns, only a few being scattered over the islands. The traders resident in the country, Dr. Barry represents as decent, peaceable, industrious, honest people, who commonly unite the business of the farmer with that of retail dealer. The shopkeepers of Stromness are said to bear the same character, but in Kirkwall, though undoubtedly many exceptions are to be found, dealers are unhappily deficient both in industry and education. A similar remark may be applied to those who follow mechanical employments in that town.

With respect to the third class, which comprehends all those connected with the cultivation of the land, such as farmers with their servants and cottagers, it may in general be observed that they are, in a high degree, indolent, wedded to old customs, averse from improvement, dark, artful, in-

terested, and more respectful to their superiors from fear than attachment. But with these defects and vices are blended some good and amiable qualities. In point of understanding they are scarcely inferior to any peasantry in Great Britain. They are faithful in the observance of the marriage vow, affectionate to their children, and usually honest in their transactions with one another, though negligent in payment of their rents. Their faults are the result of their oppressed and mean condition, and of the frauds practised upon them by unprincipled dealers in the towns, or by itinerant merchants, to whom they are compelled to dispose of their own produce, either in barter for other goods, or at a long and uncertain credit. One remedy for this evil would be the establishment of regular markets in different parts of the islands, which at present are much wanted.

Like the common people in most other places, those of Orkney, whatever profession they follow, are extremely credulous, and more inclined to trust quacks in every line than men regularly bred and distinguished for their judgment and education. The same disposition leads them to give implicit belief to all the absurd and ridiculous tales which are so frequently circulated respecting witches, fairies, and other supernatural agents. Hence a multitude of charms are still in practice to secure good fortune, relieve diseases, or to ward off some real or imaginary danger. Some days of the week are lucky, and others ominous of misfortune. Thursdays and Fridays are the only days on which they incline to enter upon the marriage state; and they are anxious, in the highest degree, to avoid doing it except when the moon is waxing. When intending to kill an ox or a sheep, they are careful that it shall be done during the first quarters of that luminary, conceiving that if it is delayed till the waning, the meat will be of an inferior quality. In setting out on a voyage, they always turn their boats in the direction of the sun's motion, and utter a short prayer. Though Presbyterians in profession, they still retain many relics of Romish superstition, and have a great veneration for ancient places of worship, especially such as have been dedicated to favourite saints. These they invoke to assist them in any emergency, and vow to perform services, or present oblations to them if their prayer is granted. The festivals of the Popish calendar are observed with the utmost punctuality, not indeed as times of religious worship, but as days set apart for feasting and conviviality. On some of these days they refrain from work, and on others, only undertake work of a certain kind, and for a certain period. At one time they must go fishing, at another they carefully avoid that sort of employment; now they must eat fish, now flesh, now eggs, milk, &c. according as the particular day, or season, may require.

Antiquities.—From the historical importance of the Orkneys, at a very early period, and during so many centuries after the Norwegian conquest, it might readily be conjectured that they must contain numerous remains of antiquity of different kinds, and assignable to different ages. This is accordingly the fact, and we believe few districts are more worthy than these islands of antiquarian investigation. All the shores and headlands abound with those buildings which have been denominated Picts-houses; but the precise use of which is not yet determined by the researches of the learned. Sometimes they appear single and detached, and at other times are collected together in considerable numbers. One of them, at Quarterness, near Kirkwall, on the Mainland, is minutely described by Dr. Barry. (See POMONA.) At Stennis also, on the Mainland, is one of those circles of stones, commonly regarded as Druidical temples, and on this, as well as on most of the other islands, may be seen a

number of huge single stone monuments, of which it is not easy to conjecture the origin or intention. They are usually from twelve to twenty feet in height above ground, and five or six feet in diameter each way; and as most of them are placed on lofty situations, it may justly excite wonder, how, in the ignorance of mechanical powers, they could be brought hither and erected. As they bear no inscription, or hieroglyphics, nor any marks of an instrument, but are as rude and unpolished as when dug up from the quarry, it seems consonant to reason to consider them as the monuments of a very early age, when the people were ignorant of arts and of letters. And this is all that can be said concerning them, for not even tradition affords the smallest clew to determine the purpose of their erection. Some indeed have hazarded the supposition that they were intended to mark the spot that contained the bones of a deceased prince or chieftain, or to serve as a boundary between the lands of one great man and another; but the first idea is rendered extremely improbable by the fact that no tumuli, urns, or graves, have hitherto been found near them; and it is scarcely possible to conceive that any set of men would expend so much labour on landmarks as the quarrying, removal, and fixing of such immense masses must of necessity have required. The writer of this article is therefore inclined to regard them as belonging to the same class of antiquities with the circles of Stennis, Avebury, or Stonehenge, that is, either as monuments of religion, or memorials of some great national event. In the island of Westray, are a number of stone sepulchres scattered over two extensive plains. Some of them have been opened, and found to contain human bones, and a variety of warlike and domestic instruments. Similar burying places have been discovered at Skael on the Mainland, and at Rowsholm in Stronfay. At Skael is likewise a curious causeway about a quarter of a mile long, composed of reddish stones impressed with a variety of figures. The vestiges of many ancient buildings can be traced in different parts of the islands; and some structures of less antiquity are still tolerably entire. Among the latter may be mentioned the cathedral of St. Magnus, the bishop's palace and the king's castle at Kirkwall. The first is kept in good repair, but the two last are extremely ruinous. In the island of Weir are the remains of the castle of Coppirow, or Cubbirow, built by Kobbem Stavanga, a man of great note in the twelfth century. This edifice forms a square of fifteen feet on each side; and is surrounded by ditches and ramparts, which, with the strength of its walls, evinces it to have been a fortification of no small importance. Of the numerous other buildings characterised by ancient writers as lofty and magnificent piles, few retain traces sufficient to mark decidedly the site on which they stood. The bishop's palace in Eaglethay, the house of Siguid of Westness, that of Sween in Gairfay, the castle of Damsfay, the residence of Thorkil in Sandwich, the palace of the earls in Orphir, and the celebrated palaces of the princes and bishops in Birfa, are now completely demolished. These last stood on a fine lawn near the present church, and close to the shore, opposite to what is called the burgh of Birfa, supposed to have been formerly a rock fortification, as some remnants of a wall are yet visible on the land side. Here are numerous ruins of popish chapels, which continue to be much visited by the common people, from motives of religious veneration. On the island of Rousfay is a high ridge or mound, which has received the name of the camp of Jupiter Fring. As it is plainly, however, a natural elevation, and bears no marks of human art either on it or around it, Dr. Barry is of opinion that its present appellation has originated with some whimsical genius in later times, probably on account of this spot being a favourite haunt of the eagle;

the bird sacred to the king of gods and men. Such other vestiges of antiquity as seem worthy of notice, will be mentioned under the name of the island to which they may respectively belong. History of the Orkney Islands by the Rev. Dr. Barry, 2d edition by the Rev. James Headrick, 4to. Lond. 1808. The present marchioness of Stafford has published a folio volume, with several etchings executed by her own hand, illustrative of the scenery, antiquities, &c. of the Orkneys; only 150 copies of this curious, and certainly interesting volume, were printed, and those for presentation; when the copper-plates were destroyed. Fauna Orcadenfis, or the Natural History of the Orkney and Shetland Islands, 4to. 1813, by the Rev. Geo. Low.

ORLAMUNDY, a town of Saxony, in the principality of Altenburg, at the conflux of the Orla and the Saal; 40 miles W.S.W. of Altenburg. N. lat. 50° 45'. E. long. 11° 25'.

ORLAND, a town of America, in Hancock county, and state of Maine, situated on the east bank of Penobscot river, at its mouth, having Bucks town on the north, Penobscot on the south, and Ellsworth on the east; 17 miles N. of Castine.

ORLANDIN, NICHOLAS, in *Biography*, a learned Italian Jesuit, was born at Florence in the year 1554. He entered the society at the age of eighteen, and distinguished himself by his proficiency in literature, particularly in the knowledge of the Latin tongue. Having finished his studies, he filled the post of Latin tutor in different houses belonging to his order, till the state of his health obliged him to relinquish that employment, when he was made rector of the college at Nola, and afterwards president of the seminary for novices at Naples. In the year 1598 he was sent for to Rome, where he undertook the task of drawing up a grand history of the Jesuits; but died in the year 1606, when he had completed only the first volume of the projected work. It was published at Rome in 1615, under the title of "Historiæ Societatis Jesu Pars prima, sive Ignatius." This work was continued by father Francis Sacchini, who at different periods published four volumes; and was at length brought down to the year 1616 by father Jouveny, who published a sixth volume at Rome in 1710. Orlandin was the author of "Annus Litteræ Societatis Jesu," for the years 1583, 1584, and 1586; and also of "Vita Petri Fabri Soc. Jes.," &c. Moreri.

ORLANDO DI LASSO, a native of Mons, in Hainault, born 1520. Orlando not only spent many years of his life in Italy, but had his musical education there; having been carried thither surreptitiously, when a child, on account of his fine voice. The historian Thuanus, who has given Orlando a place among the illustrious men of his time, tells us, that it was a common practice for young singers to be forced away from their parents, and detained in the service of princes; and that Orlando was carried to Milan, Naples, and Sicily, by Ferdinand Gonzago. Afterwards, when he was grown up, and probably had lost his voice, he went to Rome, where he taught music during two years; at the expiration of which, he travelled through different parts of Italy and France with Julius Cæsar Brancatius, and at length, returning to Flanders, resided many years at Antwerp, till being invited by the duke of Bavaria to Munich, he settled at that court, and married. He had afterwards an invitation, accompanied with the promise of great emoluments, from Charles IX. king of France, to take upon him the office of master and director of his band; an honour which he accepted, but was stopped on the road to Paris, by the news of that monarch's death. After this event he returned to Munich, whither he was recalled by William, the son and successor

successor of his patron Albert, to the same office which he had held under his father. Orlando continued at this court till his death, in the year 1593, at upwards of 70 years of age. His reputation was so great, that it was said of him, "Hic ille Orlandus Lassus, qui recreat orbem."

As he lived to a considerable age, and never seems to have checked the fertility of his genius by indolence, his compositions exceed in number even those of Palestrina. There is a complete catalogue of them in Draudius, amounting to upwards of fifty different works, consisting of masses, magnificats, passions, motets, and psalms; with Latin, Italian, German, and French songs, printed in Italy, Germany, France, and the Netherlands.

He was certainly one of the most fertile and able musicians whom Europe had then known, since the invention of counterpoint. Among the great number of his works, the "Magnum Opus Orlando di Lassus complectens omnes Cantiones quas Motetas vulgo vocant tam antea editas, quam hactenus nondum publicatas, a 2 ad 12 Voc., Monachii, 1604," 7 vols. in folio, is much esteemed. But in France, his popularity chiefly arose from the great number of songs by Ronfard and Clement Marot, which he set to music, and which were printed by Adrian le Roy, from 1576 to 1584. His compositions were in high favour in England, during the reign of queen Elizabeth.

Two of Orlando di Lassus's sons, Ferdinand and Redolph, were able musicians, and both in the service of Maximilian, duke of Bavaria; the eldest as chapel-master, and the other as organist to that prince. They were these musicians who collected their father's works, in 7 vols. folio, and published them in a very splendid and sumptuous manner, dedicating them to their patron, the sovereign of Bavaria. The general reception, however, of these compositions seems not to have equalled the expectations of the editors: other productions had taken possession of the public ear and favour. It is, we fear, in vain to hope for the revival of old music; too many are interested in the success of the new; and such are the vicissitudes of what are called taste and expression in this art, that if sufficient probity and zeal could be found in fashionable performers, to incline them to attempt doing justice to the productions of former times, it is hardly possible for them to succeed; the accent, energy, and expression are either lost in the execution, or unintelligible to the hearers. There is, indeed, as little chance for a musician of the present age to perform such productions in the manner of the times in which they were composed, as to pronounce a foreign language as well as his own; and if, against all calculation, he should succeed, this music will still be an unknown tongue to the public.

We saw, in 1772, Orlando's tomb in the Recollet's church-yard at Munich. On it are carved his own figure, with those of his wife, three sons, and eight daughters, kneeling by him; date 1595, with a long Latin epitaph.

ORLAY, BERNARD VAN, was born at Brussels about the year 1490. He went to Rome to study painting, when very young, and had the good fortune to become a disciple of Raphael Sanzio.

Upon his return to Brabant, he was appointed principal painter to the governors of the Netherlands, and was employed for several years by the emperor Charles V., being considered as one of the best painters of his time.

The prince of Nassau engaged him to paint sixteen cartoons, as models for tapestries, which were intended for the decorations of his palace at Breda. Each cartoon consisted of only two figures, a knight and a lady on horseback, representing some of the Nassau family. They were thought

worthy of a scholar of Raphael, and were afterwards copied by Jordans in oil. He died in 1560, aged 70.

ORLAY, RICHARD VAN, was born at Brussels in 1652, the son of Peter Van Orlay, an indifferent landscape painter, from whom, of course, Richard first received the rudiments of his art.

He furnished the world with a prodigious number of works, and is one of those who have contributed to puzzle the connoisseurs, by having at different periods chosen different masters as his models, and made compositions in their peculiar tastes of style. Altano, Pietro da Cortona, and frequently Nicolo Poussin, suffer in reputation, by having Van Orlay's labours attributed to them, which are nevertheless ingenious enough to give their author a decent place in the scale of artists. He died in 1732, aged 80.

ORLE, ORLET, or *Orlo*, in *Architecture*, a fillet under the ovolo, or quarter-round of a capital.

The word is French, formed from the Latin *orletum*, or *orlum*, of *ora*, a border or *list*.

When it is at the top or bottom of the shaft, it is called the *cinçure*.

Palladio also uses *orlo* for the plinth of the bases of columns and pedestals.

ORLE, in *Heraldry*, is an ordinary in form of a fillet, drawn round the shield, near the edge or extremity thereof, leaving the field vacant in the middle. Or it is an inner border (see BORDER), of the same shape as the escutcheon, which doth not touch the extremities of the shield, the field being seen within and round it on both sides; so that it appears like an escutcheon voided.

Its breadth is but half that of the bordure, which contains a fifth part of the shield; the orle only a tenth; add, that the orle is its own breadth distant from the edge of the shield; whereas the bordure comes to the edge itself.

There is sometimes one orle, sometimes there are two, and sometimes three. When there are three, or more, they take up the whole shield. It is sometimes borne flory, or counter-flory, or like the *treasure*; which see.

The form of the orle is the same with that of the shield; whence it resembles an inescutcheon; as represented in the *Plate of Heraldry*.

The edges of the orle may be ingrailed, indented, inverted, &c. When any bearings, as martlets, trefoils, &c. are placed round an escutcheon, on a field, they are termed, or said to be, *in orle*. Some writers mention the number of martlets: but in this, says Edmondson, they express themselves erroneously; because martlets, trefoils, &c. when placed *in orle*, are always eight in number.

ORLEANA, in the *Materia Medica*, the name of the amotto, or roucou.

ORLEANOIS, in *Geography*, a province of France, before the revolution, bounded on the north by Normandy and Isle de France, on the east by Isle de France, on the south by Nivernois, Berri, and Touraine, on the west by Maine and Perche; lying between 47° 15' and 48° 40' N. lat., and between 0° 35' and 3° 30' E. long.; being 33 leagues from north to south, and 42 from west to east. This government included Orleanois proper, Sologne, Blaisois, Beauce, Dunois, Vendomois, the greatest part of Gatinais, and Perche Gouet. It derived its name from Orleans, its capital. The forest of Orleanois, north of the capital, is 15 leagues long, and from two to five broad. This province, together with the Blaisois and Chartrain, is now divided into the three departments of Loire and Cher, the Loiret, and the Eure and Loire.

ORLEANS, PETER JOSEPH DE, in *Biography*, was born at Bourges in 1641, of an ancient family, in the province

vince of Berry. He entered into the society of Jesuits in 1659, became a very popular preacher, but was particularly famous for his historical compositions, in which he assiduously employed himself till his death, which happened at Paris, in the year 1698. His principal work, and that by which he is most known, is his "Histoire des Revolutions d'Angleterre," in three volumes. "But English history," says the writer in the General Biography, "is a subject on which it is impossible for a Jesuit to write with a proper spirit; and that of father d'Orleans may be judged of, from his calling Magna Charta 'the rock on which the royal authority is split, and the source of all the contentions which have since agitated England,' while at the same time he avoids giving a view of the contents. From the reign of Henry VIII., if his narrative improves in interest and vivacity, it is still more distorted by the prejudices of his order." The next considerable work of this author is entitled "Histoire des Revolutions d'Espagne." The titles of several other of his works are given in the General Biog.

ORLEANS, LEWIS, *Duc de*, first prince of the blood in France, was son of Philip, duke of Orleans, afterwards regent of the kingdom, and born at Versailles in the year 1703. At the early age of sixteen he was introduced into the council of the regency, made governor of Dauphiné, and nominated grand master of the order of our Lady of Mount Carmel and St. Lazarus. In 1724 he married a princess of Baden, with whom he lived very happily about two years, when he had the misfortune to lose her by a premature death. This event led him to renounce the world, and to devote himself wholly to devotional exercises, and the study of religion and the sciences. In the year 1730 he took an apartment in the abbey of St. Genevieve, in which he at length became a constant resident. He expended his immense income in the most laudable acts of beneficence, and at the same time applied himself with great diligence and success to his literary and scientific studies, making himself master of the Hebrew, Chaldee, Syriac, and Greek languages. He also became well acquainted with the writings of the ablest divines, ecclesiastical historians, and fathers. He was likewise extremely well versed in general history, geography, botany, chemistry, natural history, natural philosophy, and the art of painting. He fell a sacrifice to the intenseness of his study, and to the severity of the discipline to which he subjected himself, and died in 1752, when he was in the 59th year of his age. He left behind him a vast number of theological works, some of which possessed great merit. They, and a very valuable library, were bequeathed by him to the Dominican order. His son Lewis Philip, duke of Orleans, died in 1785, at the age of 60. *Moreiri.*

ORLEANS, PHILIP LOUIS JOSEPH, *Duke of*, was born at St. Cloud in 1747, and became exceedingly notorious in the late revolution. In his youth, his title was that of duke of Chartres. He was brought up to the sea-service; and in 1778 we find him on board the fleet, commanded by count d'Orvilliers: but we have no account of his having distinguished himself at that, or any other time. It has indeed been recorded, to his disgrace, that, in the action with Keppel, he went down into the hold, and refused to appear on deck till the engagement was over. This fact, if true, would be sufficient to put a stamp on his character for every thing that was bad: cowardice, in a military officer, is reckoned, of all others, the foulest stain that can attach to it. After this, however, he was raised to a still higher rank in the navy, but without having any opportunity of redeeming his credit, or of adding to his disgrace. Upon his return, he became extremely dissipated; and anxious to signalize himself, where he probably expected little danger, he

joined the popular party against the measures of the court. He violently opposed the registering the edicts of the king, as an infringement of the rights of parliament; and entered his written protest against it. The parliament confirmed the protest; and on the next day the duke was ordered to retire to his country-seat, at the distance of 15 leagues from Paris, and to receive no company there, excepting his own family. He was regarded as the victim to the power of the court. As first prince of the blood, his situation allowed of no increase of dignity; his immense revenue was thought to exceed that of any other subject in Europe: therefore, as far as honour or wealth was concerned, he could not expect any augmentation, by a change in the government; his conduct was accordingly regarded by the mass of the people as purely patriotic, and he obtained the title of "Prince of the patriots." He was not contented with this, but was desirous of going before the public; and accordingly, at a later period, he assumed the title of citizen Egalité. He was elected president of the national assembly in 1789, but he declined the honour intended him. About this time, the people were suffering most grievously by a scarcity, almost approaching to a famine; and he liberally expended his immense income in relieving, as far as he was able, those necessities which he could not avert: hence he became not only obnoxious to the champions of arbitrary power, but was looked upon with extreme jealousy by those who hoped to rise by the favour of the multitude, and who, having little or no fortune with which to purchase their voices, found themselves eclipsed by his superior rank and influence. These insinuated that the name and popularity of the duke might be applied to purposes the most dangerous; and the duke, who it was thought had given no insignificant proof of his forbearance, by declining the proffered honour of president of the national assembly, now established his character for moderation, by yielding to the wishes of his sovereign, and accepting a commission to the court of St. James, he withdrew himself from the eyes of his partial countrymen. This was towards the close of the year 1789; but in the beginning of the following year, rumours were propagated, and reports industriously circulated, the most injurious to the reputation of the duke of Orleans. But that prince, by his sudden and unexpected return, confounded the malice of his enemies, and set at defiance charges that would probably have never been made in his presence, and which, as they were unsupported by circumstances, were treated by the national assembly as frivolous, and unworthy of any credit. Notwithstanding this acquittal, he was suspected by those who were neither deficient in penetration nor candour, of having very ambitious designs, and of secretly attempting the dethronement and destruction of the royal family. This became more apparent, from his conduct on the trial of the king. In the course of that transaction, nothing created greater surprise and horror than that the self-created l'Egalité should vote, not only for the death of his sovereign and very near relation, but against allowing him any appeal to the people. It was said in his justification, that he intended to have abstained from giving his vote, but that he was terrified into the act by the threats of the ferocious Robespierre. When, on the first question of guilty, or not guilty, he pronounced the affirmative, a general murmur pervaded the convention: his vote against the appeal to the people was received with equal indications of surprise; and his opinion on the third question of life or death was awaited with curiosity and impatience. From the tribune he deliberately pronounced these words: "Influenced by no consideration but that of performing my duty; convinced that all who have conspired,

or who shall hereafter conspire, against the sovereignty of the people deserve death; I VOTE FOR DEATH." The assembly, though not remarkable for its compassion, when the king or his family was concerned, was in a general ferment: one member, starting from his seat, and striking his hands together, exclaimed, "Ah, le scelerat!" and many joined in the expression, and added, "Oh, l'horreur! Oh, le monstre!" This was in January 1793; and before the close of the year, he was doomed to a like fate. On the 2d of November he was brought to Paris, and on the 6th he was convicted and executed, unpitied by persons of all parties. In his way to the scaffold, he was overwhelmed with all the abuse and indignities that a rancorous and cruel populace could devise; but on that occasion, aware that he did not merit the persecution of the people, from whom it came, and on whom he had liberally expended his property, he called forth a degree of dignity and courage that was unexpected, and submitted to the blow with decent fortitude. Adolphus's History of France, 1803. Hist. of Revolution, by Rabaut de St. Etienne.

ORLEANS, in *Geography*, a city of France, and principal place of a district, as well as capital of the department of the Loiret. It is divided into three parts, containing 36,165 inhabitants; and its three cantons contain 45,630 inhabitants, on a territory of $12\frac{1}{2}$ kilometres, in one commune. It was formerly called Aureliana Civitas, Cenabum or Genabum, and being the capital of the province of Orleanois, was a bishop's see, the residence of the Merovingian line, and the seat of five councils. The city is large and indifferently built; it contains a cathedral of excellent Gothic architecture with a handsome spire, 22 parish churches, an old university, and a literary society. The city is pleasantly situated at the foot of a declivity bathed by the Loire; 24 leagues S.S.W. of Paris. Without including several suburbs, the city is 2396 toises in circuit, formerly environed by a wall and ditch. The mall is an agreeable walk, 2890 feet in length: and here is a fine stone bridge of 16 arches over the Loire. Orleans has some traffic in corn, wine, and brandy; its manufactures are cloth, stockings, refining of sugar, &c. North of it is an extensive forest, and the country from hence to Paris is flat and uninteresting. This city was taken by Julius Cæsar; in 451 it was besieged by Attila, king of the Huns, who was defeated by Theodoret, king of the Goths, assisted by Ætius, the general of Valentinian, and the king of the Franks. It was taken by the Normans twice, viz. in 855 and 865. The siege of the English in the year 1429, was raised by the conduct of Jean de Arc, commonly called the Maid of Orleans. N. lat. $47^{\circ} 54'$. E. long. $1^{\circ} 59'$.

ORLEANS, a county of America, being the middle of the three northern counties of Vermont; a part of the lake Memphremagog projects into the northern part of it from Canada. It contains 27 townships: the land is high, and sends its waters almost in every direction. Clyde, Barton, and Black rivers empty into lake Memphremagog; the waters of many branches of Mississcoui, Le Moelle, and Onion rivers, rising here, fall into lake Champlain; those of Mulhegan and Papanopie discharge themselves into Connecticut river. This county contains 1439 inhabitants. —Also, a post-town of Barnstable county, Massachusetts, taken from the southerly part of Eastham, and incorporated in 1797; 91 miles from Boston. Clams are found here in abundance, and constitute a profitable article of traffic. One thousand barrels, of the value of six dollars a barrel, are in some years salted here. The number of houses in 1800 amounted to 141, and the whole population consisted of 174 families, and 1095 persons.

ORLEANS, *Isle of*, an island of Canada, situated in the river St. Lawrence, at a small distance below Quebec, remarkable for the richness of its soil. The S.W. end of the island is called Point Orleans. The coast is rocky for a mile and a half within the S. channel, where is a careening place for merchants' ships. Round Point Levi, and along the S.E. side of the river, the shore is rocky, but the middle of the basin is entirely free.

ORLEANS, *New*, the capital of Louisiana, in North America, situated on the E. bank of the Mississippi, 95 miles from the mouth of the river. N. lat. $30^{\circ} 2'$. W. long. $89^{\circ} 53'$. The town is regularly laid out, the streets running at right angles, but they are very narrow, and unpaved. This town suffered much by fire in 1788, being reduced from 1100 to 200 houses in three hours; but it has been since rebuilt, principally of brick, and not as before of timber, with slated roofs. Those that are constructed of brick consist of two stories, without cellars; and the old wooden houses are of one story, raised from the ground for the accommodation of cellars. Some few houses have piazzas. The public buildings are, a handsome Catholic church, a government house, a calabozo or prison, which also serves as a court-house, a convent, barracks for the soldiers, king's hospital, a lunatic hospital, and a small market-house. The side next the river is open, and secured from its inundations by a raised bank, which extends to a distance of more than 50 miles. To the N.E. of the town are large marshes, which contribute to render it unwholesome in summer and autumn, particularly to strangers; whereas the constant inhabitants are never afflicted by the epidemic diseases which prevail among foreigners, but are said to be as long-lived as the inhabitants of the northern parts of the United States. Lake Ponchartrain communicates with the town by means of the creek St. John, which proceeds from the lakes through a course of six miles, and within two miles of the town. But a bar at the entrance of this creek prevents vessels that draw more than three or four feet of water from entering; but small craft are numerous, and passing from Mobile, Pensacola, and the adjacent country, bring their tar, lime, &c. to market by means of this communication. A canal was formed in 1792 from the creek to the town; and at the mouth of the creek where it enters the lake is a small fort of six guns. In the year 1802 the principal aggregate exports of American and Spanish produce have been estimated at

	Dollars.
30,000 bales of cotton, value	- 2,000,000
8,000 hogsheads of sugar, do.	- 480,000
90,000 hogsheads of flour, do.	- 400,000
Total	2,880,000

In the same year were exported, of former crops, about 300,000 lbs. of indigo, value 300,000 dollars. Considerable quantities of deer-skins and some furs are also exported; also tobacco, salt beef and pork, hams, laid, &c. from the Illinois and Ohio rivers. The inhabitants of New Orleans were estimated in 1802 to be 10 or 11,000. Its situation, not far from the sea, on a noble river, in a very fertile country, under a salubrious climate, and near Mexico, but still nearer to the French, Spanish, and British West India islands; with the moral certainty of its becoming a general receptacle for the produce of the extensive and valuable country on the Mississippi, Ohio, and its other branches, afford advantages which seem to ensure the growing prosperity of this city, more especially as it is now in the possession of the United States. Morse.

ORLENGA,

ORLENGA, a town of Russia, in the government of Irkutsk, or the Lena. N. lat. 56° . E. long. $105^{\circ} 40'$.

ORLEY, a town of Prussia, in Oberland; 16 miles N.N.E. of Soldau.

ORLIAC, a town of Croatia; 20 miles S. of Carlsstadt.

ORLOI, a town of Lithuania; 60 miles E. of Pinsk.

ORLOP, in *Ship Building*, a tier of beams below the lower deck of large ships, the intervals of which are framed with earlings, and laid with oak board along the midships of the ship, chiefly for the convenience of stowing away the cables. There is also a *platform* in the midships of smaller ships, called the *orlop*, and for the same purpose.

ORLOV, in *Geography*, a town of Russia, in the government of Viatka, on the Viatka. N. lat. $58^{\circ} 20'$. E. long. $49^{\circ} 44'$.—Also, an island in the Caspian sea. N. lat. $45^{\circ} 50'$. E. long. $53^{\circ} 14'$.—Also, a river of Russia, which runs into the Tchernai, N. lat. $65^{\circ} 20'$. E. long. $168^{\circ} 14'$.

ORLOVKA, a river of Russia, which runs into the Irtisch, N. lat. $53^{\circ} 50'$. E. long. $75^{\circ} 24'$.—Also, a river of Russia, in the government of Archangel, which runs into the Frozen ocean; 28 miles N. of Ponoï.

ORLOVGORODITSCH, a town of Russia, on the river Ichim; 120 miles S.E. of Tobolsk. N. lat. $56^{\circ} 32'$. E. long. $70^{\circ} 44'$.

ORLOVSKOE, a government of Russia, bounded on the N. by the governments of Smolensk and Kaluga, on the W. by Smolensk and Novgorod Sieverskoi, on the S.W. by Novgorod Sieverskoi, on the S.E. by Kurskoi and Voronezhskoi, and on the E. by Tambovskoe and Tulkoe: its length from E. to W. is 208 miles, its breadth variable from 20 to 100. N. lat. 50° to 54° . E. long. $33^{\circ} 14'$ to 39° .

ORLUCE, a town of Poland, in the palatinate of Sandomirz; 8 miles N.W. of Kreminiek.

ORLY, a town of Lithuania, in the palatinate of Brzelsk; 44 miles E. of Pinsk.

ORME, ROBERT, in *Biography*, the son of Dr. Alexander Orme, a physician and surgeon in the service of the East India Company, was born at Anjengo, in the Travancore country, in 1728. He was sent to England for his education, and was entered at Harrow-school when he was only six years of age. After he left school, he was placed for a year in the office of the accomptant-general of the African Company, in order that he might be initiated in commercial transactions, and then he embarked for Calcutta, where he arrived in 1742. At first he was not in the Company's service, but when once engaged for them, he acquired the highest reputation for the zeal with which he entered into their interests. At the same time he made the deepest researches into the institutions, manners, and customs of the natives of India, so that, in the year 1752, when some regulations were thought necessary in the police of Calcutta, he was desired to give his opinion on the subject. He accordingly drew up the greater part of "A General Idea of the Government and People of Indostan." In 1753 he returned to England, and was frequently consulted by men in power on Indian affairs, and respecting plans, at that time in agitation, for supporting the British interest in Hindoostan. Mr. Orme revisited India in 1754, having already been appointed by the court of directors a member of the council at Fort St. George. He seconded, by his able and spirited advice, those measures which annihilated the French power in that country, and gave to the English that decided ascendancy which they have ever since possessed. Mr. Orme held the office of commissary and accomptant-general during the years 1757-8, but in the latter year his health obliged him to embark for England. He was taken prisoner on his return, and carried to Mauritius,

from whence he was embarked for the Cape of Good Hope. He arrived in England in the autumn of 1760, and settling in London, began to collect a choice library, and to employ himself in preparing a work on the Military Transactions in India. The first volume was published in 1763, entitled "The History of the Military Transactions of the British Nation in Indostan from the Year 1745." This volume brought down the history to the year 1756. An historical dissertation on the Mahomeddan conquests and establishments in that country, comprising a view of the peculiar character and customs of the Hindoos, was prefixed. It was extremely well received by the public. The East India Company, duly sensible of his merits, and of the importance of his historical researches, not only gave him free access to all their records, but appointed him to be their historiographer, with a salary of 400*l.* per annum. To obtain the most accurate information respecting the war which was to be the subject of the second volume, he went over to France in 1773, where he was furnished liberally with various authentic documents. It was not till 1778 that the work was brought to its completion. The second volume was now published, which contained all the events which took place in the English settlements in India from 1756 to 1763, with an investigation of the rise and progress of the English commerce in Bengal, and an account of the Mahomeddan government from its establishment in 1200. In 1782 Mr. Orme published a work, entitled "Historical Fragments of the Mogul Empire of the Marattoes, and of the English Concerns in Indostan from the Year 1659." This, which was an octavo volume, was his last publication, for though his literary pursuits were unremitted, yet his health was unequal to the exertions required for the composition. In 1792 he left the metropolis, to enjoy in retirement the society of his friends, and the recreation afforded by a well assorted library. In January 1802 he died in the seventy-third year of his age. "The intellectual character of Mr. Orme," says his biographer, "was chiefly marked by good sense, sagacity, and judgment. To these qualities were added an active curiosity, and a cultivated taste, which fitted him both for the collection and for the lucid arrangement and happy display of history. He possessed a refined taste for music, the arts of design, and poetry, and among his literary compositions are some elegant copies of verses."

After his death his "Historical Fragments" were reprinted in a quarto volume, with the addition of a paper on the "Origin of the English Establishment, and of the Company's Trade at Broach and Surat;" and another, containing "A General Idea of the Government and People of Indostan." To this volume is prefixed an account of the life and writings of the author, to which our readers are referred for farther information.

ORME, L', in *Geography*, a town of France, in the department of the Nievre, and chief place of a canton, in the district of Clamecy. The place contains 2416, and the canton 12,788 inhabitants, on a territory of 375 kilometres, in 10 communes.

ORME'S Head, Great, a cape on the N. coast of Wales, in the county of Carnarvon. N. lat. $53^{\circ} 24'$. W. long. $2^{\circ} 5'$.—Also, Little Orme's Head, a cape on the same coast, five miles S.E. of the former.

ORMEA, a town of France, in the department of the Stura, on the Tanaro; 10 miles S. of Ceva.

ORMILLOS, Los, a town of South America, in the province of Tucuman; 36 miles N. of St. Salvador de Jujui.

ORMO, a small island in the Baltic, between the coast of

of Finland, and the island of Aland. N. lat. 60° 27'. E. long. 20° 43'.

ORMOND, the name of two extensive baronies in the county of Tipperary, Ireland, distinguished by the terms Upper and Lower. From them the illustrious family of Butler took the titles of earl and duke of Ormond.

ORMOSIA, in *Botany*, a genus founded by the late Mr. George Jackson, F.L.S. and named by him from *ορμος*, a necklace, or string of beads, because the beautiful seeds, parti-coloured of scarlet and black, are worn, by ladies, in the West Indies, as well as in Europe; being usually intermixed with those of *Abrus precatorius*, with which they agree in colours, though they greatly exceed the *Abrus* in size. Jackson Tr. of Linn. Soc. v. 10. 358. Brown in Ait. Hort Kew. ed. 2. v. 3. 3. Clafs and order, *Decandria Monogynia*. Nat. Ord. *Papilionaceæ*, Linn. *Leguminosæ*, Juss.

Gen. Ch. *Cal.* Perianth of one leaf, inferior, short, bell-shaped, gibbous at the base, two-lipped; upper lip two-lobed; lower in three deep segments. *Cor.* papilionaceous, of five petals, with linear claws; standard roundish, emarginate, erect, scarcely longer than the wings, convex; wings two, oblique, obtuse, somewhat heart-shaped at the base; keel of two obtuse hatchet-shaped petals, the length of the wings. *Stam.* Filaments ten, separate, awl-shaped, the length of the corolla, concealed in the keel; anthers roundish, of two cells. *Pist.* Germen superior, ovate-oblong; style the size and shape of the filaments, incurved; stigmas two, obtuse, approximated, one above the other. *Peric.* Legume woody, compressed, of two valves and one cell. *Seeds* one or more, orbicular, compressed, large, coloured.

Eff. Ch. Calyx five-cleft, two-lipped. Corolla papilionaceous. Stigmas two, approximated, obtuse; one of them lateral. Legume woody, compressed. Seeds one to three.

1. *O. coccinea*. Scarlet Necklace-tree. Jackf. Tr of Linn. Soc. v. 10. 360. t. 25. (*Robinia coccinea*; Aubl. Guian. v. 2. 773, excluding Plumier's synonym.)—Leaves pinnate; leaflets coriaceous, ovate, revolute, naked on both sides. Legume smooth and shining.—Native of Guiana; not yet introduced alive into Europe. A tree, with zigzag branches, clothed with rusty down. Leaves a foot long or more, composed of from four to six pair of stalked leaflets, each near three inches in length, elliptical or ovate, and entire, furnished with a strong midrib, and many fine transverse veins. *Stipulas* in pairs, distinct from the footstalk. *Flowers* in a large, terminal, racemose panicle, purplish. Legume short, very hard and shining. *Seeds* mostly solitary, rarely two, shining, scarlet with a large black spot.

2. *O. dasycarpa*. Rusty-podded Necklace-tree. Jackf. n. 2. t. 26. Ait. n. 1. (*Sophora monosperma*; Swartz Ind. Occ. 722. Willd. Sp. Pl. v. 2. 501.)—Leaves pinnate; leaflets numerous, pointed, flat, smooth on both sides. Legume downy.—Native of Jamaica and other parts of the West Indies; brought by Capt. Bligh, in 1793, to Kew, where it flowers in the stove in June and July. Much like the former, but differing in the above characters. The legume is often orbicular, with one seed only; sometimes oblong, with two or three.

3. *O. coarctata*. Close-flowered Necklace-tree. Jackf. n. 3. t. 27.—Leaves pinnate; leaflets unequal; naked above; rusty and hairy beneath.—Gathered by Mr. Alexander Anderson in Guiana. The leaves are smaller than in the last; their leaflets gradually larger as they recede from the branch. Panicle dense and short, though of many flowers. *Germen* hairy. *Seeds* like the last, but smaller.

ORMSKIRK, in *Geography*, a market town in the hundred of West-Derby, and county palatine of Lancaster, England,

is situated at the distance of 40 miles S. by W. from Lancaster, and 209½ miles N.W. by N. from London. It consists chiefly of four principal streets, which intersect each other nearly at right angles. The property of this town anciently belonged to Burfough priory, in the neighbourhood. Edward I. conferred on it the privilege of a market and fair, and this grant was renewed and confirmed by his successor, with additional immunities. Ormskirk at present is a considerable manufacturing place; a large quantity of cotton, and thread for making sail-cloth, being spun here, both by the hand and by means of machinery. Here are held the petty sessions for the Ormskirk division of the hundred. The market day is Saturday weekly, and there are two fairs during the year. The church, an ancient structure, with a tower at one end, possesses the remarkable feature of having a spire entirely detached from it. The reason of this strange circumstance remains unknown; but as it is an anomaly in our sacred architecture, it seems not unlikely to have been merely the result of whim, to which source indeed it is ascribed by tradition. The interior of this church contains several monuments in honour of the Stanlies, earls of Derby.

According to the parliamentary returns of 1811, Ormskirk comprises 678 houses, and 3064 inhabitants, which is an increase, since 1801, of 64 houses, and 510 persons.

Two miles north from the town stand the remains of Burfough priory. This house was founded in the time of Richard I. by Robert Fitzhenry, lord of Lathom, who bestowed upon the monks considerable property, emoluments, and alms. Lathom-house, situated in its vicinity, is noted for the vigorous defence which Charlotte, countess of Derby, made against the parliamentary forces dispatched to besiege it in the reign of Charles I. After losing about two thousand men, the republican commanders were compelled to raise the siege, by the approach of prince Rupert, without having been able to bring the heroic countess to submission either by force or persuasion. The present house is the seat of E. Wilbraham Bootle, esq. M.P. Beauties of England and Wales, vol. iv., by John Britton, F.S.A.

ORMUS, or **HORMUZ**, an island of Asia, at the entrance of the Persian gulf, about 10 miles in circumference; distant about five miles from the continent of Persia, and somewhat more than 25 from that of Arabia, formerly much celebrated, but now retaining little or nothing of its ancient splendour. It has lately belonged to Mulla Ali Shah, a Persian, who made himself master of it immediately after the death of Nadir Shah, whose admiral he had been. This prince of Ormus possesses likewise a part of the isle of Kishme, the other part being subject to the prince of Seer. This small island is traversed by a high mountain from E. to W., and is believed to be anciently a volcano; it is full of rocks, barren and destitute of all necessaries, except salt, of which there is such plenty, and that so hard, that it is said to be used in building houses. The soil is composed of a white sand, formerly imported into Europe. It has no water but that which is preserved, after rain, in cisterns; so that, in its most flourishing times, when it was the emporium of this part of the world, its inhabitants had not only their victuals, but also the water they used from the continent. The air in summer was so excessively sultry, that people were forced to live in grots. Its commodious situation, however, rendered it formerly the most famous mart in the East. Ships repaired hither from all parts of the Indies, from the coasts of Africa, Egypt, and Arabia, and a regular trade was carried on by caravans across the country. Hence its sovereigns, who possessed some small territory upon the continent of Persia, became rich and powerful; and at proper seasons of the year, merchants resorted to it from

from all countries, and particularly the Venetians, who carried on a great trade in jewels transported from hence to Bassora, and by caravans to Aleppo, or to Suez by sea, then overland, by the Nile, to Alexandria, where they were delivered to the merchants to whom they were consigned. Its commercial accommodations and celebrity drew the attention of the Portuguese, who made themselves masters of the town and citadel. The former stood upon the sea-coast, and consisted of about 3000 houses; and the inhabitants, consisting of Arabians, Mahometans, Indians, and Jews, were estimated at 40,000. The fortress built on a point of land was regular, beautiful, and strong; and at length furnished with 300 pieces of cannon. Caravans passed twice a year, viz. in April and September, from Aleppo to Bassora, and thence were transported to the isle of Ormus. These caravans consisted of 5 or 6000 persons, and brought with them articles of immense value. At the same time, private ships navigated the sea from Malacca, and the caravans that traversed Persia, brought vast quantities of rich and valuable commodities. The city and castle of Ormus were in ancient times deemed the pride and glory of the East, the magnificence of which was expressed after the oriental manner, in this phrase, "that the world being round as a ring, Ormus might be considered as its jewel." By the wealth which flowed into and from it, in the manner already related, it became the richest and most busy, not to add the most delightful place in the world. This city was founded at the beginning of the 14th century; and the famous Persian monarch, Shah Abbas, with the assistance of the English, destroyed it in 1622, hoping thus to transfer its trade to Gambroon or Bander-Abassi, i. e. the port of Abbas; the moiety of the customs of which port he granted the English for their good service. Gambroon, however, is far from being what Ormus was. When Ormus was lost by the Portuguese, it was computed, that exclusively of jewels and rich merchandise, the plunder and ready money amounted to more than two millions. The Portuguese afterwards made an attempt for the recovery of Ormus, but were disappointed in consequence of failure of succour and support from the viceroy of Goa; and the place remained in a ruined state. N. lat. $27^{\circ} 8'$. E. long. $56^{\circ} 40'$.

ORNAMENTS, in *Architecture*, express all the sculpture, or carved work, with which a piece of architecture is enriched.

ORNAMENTS in Relievo, are those carved on the contours of mouldings: as leaves, shells, scrolls, flowers, &c. See **RELIEVO**.

ORNAMENTS in Creux, are those cut within the mouldings; as eggs, flutes, &c. See **CREUX**.

Vitruvius and Vignola also use the word ornament to signify the entablature.

ORNAMENTS, Distribution of. See **DISTRIBUTION**.

ORNANO, in *Geography*, a town of the island of Corsica, and chief place of a canton, in the district of Ajaccio; the canton contains 4478 inhabitants.

ORNANS, a town of France, in the department of the Doubs, and chief place of a canton, in the district of Besançon; nine miles S.S.E. of it. The place contains 3500, and the canton 13,838 inhabitants, on a territory of $272\frac{1}{2}$ kilometres, in 28 communes. N. lat. $47^{\circ} 6'$. E. long. $6^{\circ} 13'$.

ORNE, one of the nine departments of the N.W. region of France; composed of the south part of Normandy, and almost the whole of Perche, is bounded on the N. by the department of the Calvados, on the N.E. by the department of the Eure, on the E. by the department of the Eure and Loire, on the S. by the departments of the Sarthe

and the Mayenne, and on the W. by the department of the Channel, in N. lat. $48^{\circ} 10'$; 32 French leagues in length, and 15 in breadth; containing 6375 kilometres, or 310 square leagues, and 397,931 inhabitants. It is divided into four districts, or circles, 35 cantons, and 627 communes. The circles are Domfront, including 110,526, Argentan, 106,495, Alençon, 67,372, and Montagne, 113,538 inhabitants. According to Hassenfratz, the circles are six, the cantons 51, and the number of inhabitants 348,972. The contributions in the 11th year of the new era amounted to 3,666,903 fr. and the expences to 535,186 fr. 33 cents. The capital is Alençon.

This department is traversed from E. to W. by a ridge of hills partially covered with forests, and contains many tracts of an indifferent soil, yielding grain, flax, hemp, and pastures. Here are iron mines and mineral springs.

ORNES, a town of France, in the department of the Meuse; six miles N.N.E. of Nerdun.

ORNITHIÆ, a name given by the ancients to certain winds, which usually blew in spring, at the time when the birds of passage came over to them. Pliny says, that these winds blew from the west, and that, by some, the Etesian winds were called by this name. Others suppose that they blew from the north, or north-west.

ORNITHOGALUM, in *Botany*, an ancient name, adopted by the Latins from the Greeks, evidently derived from *ορνις*, *ορνιθος*, a bird, and *γαλα*, milk; but its application has proved a stumbling block to most etymologists. Ambrosius presumes the word may allude, either to the shining milky white of the flowers, like that of a hen's egg; or to the white egg-shaped bulbs. Tournefort supposes the flowers, being green when closed, and white when expanded, may have been compared to the wings of several birds. Linnæus first gave the true explanation, in suggesting, (*Mant.* 364. *Prælect. in Ord. Nat.* 287), that the *O. umbellatum* appears to be the "doves' dung," mentioned in the 2d book of Kings, chap. vi. v. 25, as having fetched so high a price during the siege of Samaria. It is recorded by the sacred writer, that a quarter of a cab of dove's dung then sold for five pieces of silver; and the rabbinical commentators, taking the words literally, have asserted, absurdly enough, that it was used as fuel. As the plant grows copiously in Palestine, whence the English name, star of Bethlehem, and the roots are still in common use for food in that country, the name is explained by the resemblance in the colours of the flower to the dung of birds, the white or milky part of which, their urine, is contrasted with dull green, exactly as in the petals of this original species of the genus before us, and which appears to be the very one described by Dioscorides. The writer of the present article had the satisfaction of finding this, his own explanation of the matter, had previously occurred to Linnæus.—*Linn. Gen.* 166. *Schreb.* 221. *Willd. Sp. Pl.* v. 2. 111. *Mart. Mill. Dict.* v. 3. *Sm. Fl. Brit.* 362. *Prodr. Fl. Græc. Sibth.* v. 1. 229. *Ait. Hort. Kew. ed. 2. v. 2. 256. Tournef. t. 203. Juss. 53. Lamarck Dict. v. 4. 612. Illustr. t. 242. Gært. t. 17.—Class and order, Hexandria Monogynia. Nat. Ord. Coronarie, Linn. Asphodeli, Juss.*

Gen. Ch. Cal. none. *Cor.* Petals six, lanceolate, their lower half erect; upper spreading; permanent, fading. *Stam.* Filaments six, erect, alternately dilated at the base, shorter than the corolla; anthers simple. *Pist.* Germen angulated; style awl-shaped, permanent; stigma obtuse. *Peric.* Capsule superior, roundish, angulated, of three cells and three valves. *Seeds* several, roundish.

Obf. In some species the filaments are flat and erect, the alternate ones trifid at the top, their middle point bearing

bearing the anther; in others the alternate filaments are simple.

Eff. Ch. Corolla of six petals, erect, permanent, their upper part spreading. Filaments dilated at the base. Capsule superior, of three cells. Seeds roundish, naked.

Obf. Of this beautiful and extensive genus the 14th edition of *Système Vegetabilium* mentions only 22 species, distributed into two sections; first such as have all their filaments awl-shaped; secondly, such as have the alternate stamens emarginate. But this arrangement is abolished in Willdenow who gives 43 species, and in the 2d edition of *Hortus Kewensis*, where 24 are mentioned. We shall select several for the sake of illustration, two of which, *arvense* and *nanum*, are not in Willdenow.

O. uniflorum. One-flowered Star of Bethlehem. Linn. Mant. 62. Laxm. in Nov. Comm. Petrop. v. 18. 529. t. 6. f. 3.—Stem with two approximated leaves. Flower solitary. Outer petals lanceolate, abrupt; inner twice as broad, elliptical. Found on the summits of some hills in Siberia. It flowers at Kew in May and June. This species greatly resembles *O. luteum* in herbage, but the flower is solitary, and thrice as large, with broad petals, approaching to our *Melanthium flavum*. (See MELANTHIUM.) The stem is almost a span high, bearing two lanceolate leaves, nearly opposite. Petals yellow above, green below, an inch long or more.

O. spathaceum. Sheathed Star of Bethlehem. Hayne in Uft. Annal. fasc. 21. 11. t. 1. Willd. n. 4. Sm. Fl. Græc. Sibth. t. 331, unpublished. (*O. minimum*; Fl. Dan. t. 612.)—Corymb simple, of few flowers, on smooth stalks. Bractæas lanceolate, slightly fringed. Leaves linear.—Native of the Levant, as well as of Germany and Denmark.—A small species, with two linear, very slender, radical leaves; broad bractæas, one of them far below the corymb, and never more than three flowers, whose narrow obtuse petals are yellow above, green beneath. The figure in *Fl. Dan.* makes them by far too broad and pointed.

O. arvense. Yellow Field Star of Bethlehem. Perfoon in Uft. Annal. fasc. 11. 8. t. 1. f. 2. Sm. Fl. Græc. t. 332, unpublished. (*O. angustifolium bulbiferum*; Tourn. Inst. 379.)—Corymb compound, many-flowered, downy. Bractæas lanceolate, fringed. Leaves linear.—Frequent in the Levant.—Much larger than the last, with the numerous flower-stalks, and under side of the petals, downy. There are many small partial bractæas.

O. luteum. Common Yellow Star of Bethlehem. Linn. Sp. Pl. 439. Engl. Bot. t. 21. Fl. Dan. t. 378.—Stalk angular, with a linear leaf at its base. Flower-stalks umbel-like, smooth, undivided. Petals lanceolate.—Occasionally found early in the spring, about woods and pastures in Oxfordshire, Yorkshire, and some other parts of England, as well as on the continent. The stem, or rather stalk, is triangular, near a span high. Leaves keeled, linear-lanceolate, radical, and mostly solitary. Bractæas two, unequal, fringed, broadish. Umbel smooth, of several flowers, coloured as in the two foregoing.

O. nanum. Dwarf White Star of Bethlehem. Sm. Prodr. Fl. Græc. Sibth. v. 1. 230. Fl. Græc. t. 333, unpublished. (*O. humifusum, floribus umbellatis albis*; Buxb. Cent. 2. 35. t. 37. f. 1.)—Corymb simple, smooth, longer than its stalk, of few flowers. Bractæas inflated, membranous. Leaves linear, numerous.—Gathered by Dr. J. Sibthorp in Arcadia, as well as near Abydos, flowering in March. The bulb is as big as a hazel-nut. Leaves six or more, widely spreading, six inches long, narrow, rather glaucous. Stalk very short, bearing two or three large, erect, white

flowers, ribbed with green, three of whose stamens are dilated at the base.

O. umbellatum. Common Star of Bethlehem. Linn. Sp. Pl. 441. Engl. Bot. t. 130. Jacq. Austr. t. 343. Redout. Liliac. t. 143.—Corymb simple, many-flowered, its lower stalks rising above the rest. Filaments tapering, entire.—Not unfrequent in meadows, pastures and groves in England, flowering in April and May. Dr. Sibthorp found it abundantly in the fields of Greece, nor does this species seem to be rare throughout the Levant. It is unquestionably the *ορνιθογαλον* of Dioscorides, and we have already explained that name. With us it is frequent in gardens, conspicuous in the spring for its large umbel-like corymb of shining white starry blossoms, green at the back. The roots are eaten boiled, chiefly by poor people, in the Levant.

O. pyrenaicum. Spiked Star of Bethlehem. Linn. Sp. Pl. 440. Engl. Bot. t. 499. Jacq. Austr. t. 103. Redout. Liliac. t. 234.—Cluster very long. Petals linear, obtuse. Filaments all dilated. Style the length of the stamens. Partial flower-stalks equal, spreading; subsequently erect.—Native of mountainous pastures in many parts of Europe, rare in England, flowering in June and July. The leaves are radical, very long, furrowed. Stalk round, about three feet high, erect. Flowers very numerous, small, greenish, by no means ornamental. Stamens all of equal length.

O. nutans. Drooping Star of Bethlehem. Linn. Sp. Pl. 441. Engl. Bot. t. 1997. Curt. Mag. t. 269. Jacq. Austr. t. 301. Fl. Dan. t. 912. Redout. Liliac. t. 253.—Flowers pendulous toward one side. Filaments dilated, cohering, bell-shaped; three of them longer and cloven.—The original place of growth of *O. nutans* is doubtful; but Dr. Smith thinks it so far naturalized in this country as to be admissible into the British catalogue. The specimen figured in English Botany grew near Bury in Suffolk, where it flowers in great profusion early in May. Bulb large, commonly deep in the ground. Leaves all radical, pale, and somewhat glaucous, linear, channelled, acute. Stalk solitary, rather taller than the leaves, cylindrical, erect. Cluster simple, a little drooping, composed of seven or eight large, elegant, greenish, silvery-white flowers, which lean towards one side, and as they fade become pendulous.

O. laetum. Large Milk-white Star of Bethlehem. Willd. n. 14. Jacq. Ic. Rar. t. 434. Curt. Mag. t. 1134.—Cluster long, dense. Filaments awl-shaped, the alternate ones slightly dilated. Bractæas membranous, ovate. Leaves lanceolate, acute, fringed.—Native of the Cape of Good Hope, requiring with us the shelter of a frame. It blooms in summer, and is conspicuous for its numerous, crowded, large flowers, whose ovate petals are white on both sides, though greenish at the base. The leaves are about a foot long and an inch broad.

O. arabicum. Great-flowered Star of Bethlehem. Linn. Sp. Pl. 441. Herb. Linn. Curt. Mag. t. 728. Redout. Liliac. 63.—Corymb many-flowered. Filaments awl-shaped. Corolla widely bell-shaped. Outer petals with three slight blunt teeth.—Native of Egypt and Madeira, long since introduced into our gardens, where it flowers, though very rarely, in the frame in March and April. The leaves are numerous, spreading, green. Stalk above a foot high, bearing an hemispherical corymb of many very large, fragrant, white flowers, furnished with a dark-green germen.

ORNITHOGALUM, in Gardening, contains plants of the bulbous-rooted, flowery, herbaceous, perennial kinds, of which the species cultivated are: the umbelled star of Bethlehem (*O. umbellatum*); the yellow star of Bethlehem

(*O. luteum*); the small star of Bethlehem (*O. minimum*); the Pyrenean star of Bethlehem (*O. pyrenaicum*); the broad-leaved star of Bethlehem (*O. latifolium*); the pyramidal star of Bethlehem (*O. pyramidale*); the one-leaved star of Bethlehem (*O. unifolium*); the Neapolitan star of Bethlehem (*O. nutans*); the Cape ornithogalum (*O. capense*); and the golden star of Bethlehem (*O. aureum*.)

Method of Culture.—All the sorts are capable of being increased by planting the strong off-sets from the old roots in the latter end of the summer season, when their leaves and stems begin to decay, either in beds or the borders; the old roots may either be immediately replanted or kept out of the ground some time, but they flower much stronger when put into the ground in autumn, than if kept out till the spring. The small off-set bulbs should be planted out in nursery rows in beds for some time, till sufficiently large to be finally set out where they are to grow. They should have a light sandy soil, little manured.

They afterwards require the same management as other hardy bulbs, but they should be removed every other year, as when let remain longer they become weak. See BULB.

The two last sorts should have the off-sets or slips planted in separate pots, at the same time with the above, filled with good light earth, placing them under a hot-bed frame, so as to be protected from wet during the winter season, giving them full air in the summer. The old roots may be taken up in the autumn as in the other sorts, and after being kept a little while out of the ground, be replanted in the beginning of the autumn.

The hardy sorts are all highly ornamental among other flowering bulbous-rooted plants, in the borders, clumps, &c.

And the two last kinds afford variety in the collections of potted plants of the flowering bulbous-rooted sorts.

ORNITHOGLOSSUM, in *Botany*, is so denominated from *ορνις*, a bird, and *γλωσσα*, a tongue, on account of the shape of the petals. *Salisb. Parad. 54. Ait. Hort. Kew. ed. 2. v. 2. 327. Class and order, Hexandria Trigynia. Nat. Ord. Tripetaloideae, Linn. Junci, Juss.*

Gen. Ch. Cal. none, unless the corolla be taken for such. *Cor.* Petals six, lanceolate, inferior, sessile, spreading, equal, permanent, with a nectariferous depression in the base of each. *Stam.* Filaments six, inserted into the receptacle, awl-shaped, shorter than the corolla, unconnected with it, deciduous; anthers roundish-heart-shaped. *Pist.* Germen superior, roundish, furrowed; styles three, divaricated, slender, the length of the filaments, deciduous; stigmas bluntish. *Peric.* Capsule ovate, with three furrows, three cells and three valves. *Seeds* several, ovate, ranged in two rows along the edges of each partition.

Eff. Ch. Calyx none. Petals six, equal, sessile, permanent. Stamens inserted into the receptacle, deciduous. Styles deciduous. Capsule of three cells, with many seeds.

Obs. We have already alluded to this genus; see the observations under the generic character of MELANTHIUM. The only species known to us is,

1. *O. viride*. *Ait. as above. (O. glaucum; Salisb. Parad. t. 54. Melanthium viride; Thunb. Prodr. 67. Linn. Suppl. 213. Willd. Sp. Pl. v. 2. 269. Andr. Repos. t. 233.)*—Native of the Cape of Good Hope, from whence it was sent to Kew by Mr. Masson, in 1788. It flowers in the greenhouse in October or November. *Root* tuberous, perennial, annually proliferous at the summit. *Stem* obliquely ascending, by a taper base, under ground, then erect and leafy, two or three inches high. *Leaves* sheathing, alternate, spreading, lanceolate, entire, rather glaucous, smooth,

hollow, the upper ones small. *Flowers* axillary, solitary, on long stalks which are tumid at the top. *Petals* dull purple, with a glaucous tinge, channelled. There can be no doubt of Mr. Andrews's synonym, though he represents the leaves as not glaucous.

ORNITHOGLOSSUM, or *Lingua avis*, has also been used, by some authors, as a name for the seed of the ash.

ORNITHOLOGY, is a word derived from the Greek *ορνις*, a bird, and *λογος*, a discourse, and denotes that branch of natural history which considers and describes birds, their natures and kinds, their form, external and internal, and teaches their economy and uses. On many of these particulars we have treated at large under the word BIRDS, *Anatomy of*; to which we refer the reader, as we do also to the several genera in their alphabetical order. Birds have been defined as two-footed animals, covered with feathers, and furnished with wings. Like quadrupeds and the cetaceous tribe, they have warm blood, a heart with two ventricles and two auricles, and lungs for the purpose of respiration. They are, however, distinguished from both by their feet, feathers, wings, and horny bill, as well as by the circumstance of their females being oviparous.

Historical View and Classification of Ornithology.—Of the history of this department of science much has been written; we shall confine ourselves to a few particulars. Among the ancients we may notice the writings of Aristotle and Pliny. The former composed no particular treatise on birds, but he refers to them generally in several parts of his "History of Animals." He enumerates the different kinds of nourishment adapted to different species, and their various modes of feeding: he has also given an imperfect nomenclature, and remarks on the diversified modes of modification, and some interesting observations on the family of eagles. Pliny's description of the feathered race is contained chiefly in his tenth book, but it is not at all precise, and is mixed with absurdity and much fabulous matter. Among the more modern ornithologists, some have directed their labours to method and classification: some have treated of the whole class; others of particular portions of it: some have been contented to define and describe, and others have taken vast pains to illustrate what they have written by designs, not always very accurate, from living or prepared specimens. This combination of the effects of the pen, the pencil, and graver, which has so eminently contributed, in our day, to the acquisition and diffusion of knowledge, seems to have been unknown to the ancients.

Among those who first excited a taste, on the continent, for the study of ornithology, and for a methodical distribution of that portion of science, may be mentioned Peter Belon, who flourished in the middle of the 16th century, and who travelled from the laudable desire of collecting information, which, as we have seen in his article, he communicated to the world in various works. (See BELON.) His History of Birds, which is a thin volume, divided into seven parts, and illustrated by wooden cuts, was published in 1555 at Paris. The principle of classification which he adopts, is chiefly founded on the circumstances of habitation and food, and only occasionally on external forms and characters: it is accordingly very defective. His descriptions are tolerably accurate, but the figures are said to be very inadequate representations of the originals. It is however said, "that he frequently suggests judicious views of his subject; that he notes with ingenuity the points of resemblance between the human skeleton and that of birds, and that he has penned several passages which may be still perused with interest and instruction."

The next person in order to be noticed is the celebrated Conrad Gefner, of whom our readers will find a full account in the article already devoted to his labours as a naturalist and physician. He was a contemporary of Belon, and has assigned the third volume of his history of animals to the department of ornithology. It contains much learning, and exhibits alphabetical tables of the names of birds, in Hebrew, Chaldee, Arabic, Greek, Latin, and most of the spoken languages. His descriptions are chiefly compilations made by abridgments, but his references at the close of each article are numerous, and shew that his studies were extensive, and his knowledge very general. The arrangement of this naturalist is that made according to alphabetical order.

The same topics are discussed by Ulysses Aldrovandus, or Aldrovandi, a learned physician, who, as we have seen, vol. i. was denominated the modern Pliny; who availing himself of the writings of Belon and Gefner, added greatly to their stores, and compiled three folios, divided into twenty books, illustrated by wood-cuts. His catalogue comprises but few birds, excepting such as are natives of Europe. He is said to adopt too implicitly the vague distinctions of Belon, to copy too servilely from Aristotle, and to over-spread his borrowed materials with a mass of dark commentary. See ALDROVANDI.

Mr. John Johnston, mentioned in the 19th volume of the New Cyclopædia, published a thin folio on this subject, but he did little more than condense the compilations of Gefner and Aldrovandus. In his work he divides the whole class of birds into land and water-fowls, and deduces his subordinate divisions from the nature of their aliments. His descriptions are well spoken of as correct, but scanty, and even his figures, though traced with more character than those of his predecessors, exhibit much parsimony of engraving.

The next writers of eminence in this branch of zoology were our countrymen Francis Willoughby, or Willughby, esq. and Mr. Ray. The former laid the foundation of a more accurate arrangement: he observed that the history of animals had in a great measure been neglected, and accordingly he made the study of that his province, and the illustration of it his chief and most delightful employment. With this view he travelled into foreign countries, with his friends Mr. Ray, sir Philip Skippon, and other gentlemen, in the year 1663 and 4, on purpose to search out and describe the several species of animals, beasts, fishes, and insects. Though he was but a short time abroad, yet he travelled over most parts of France, Spain, Italy and Germany, in all which places he was so diligent and successful, that not many sorts of animals, described by others, escaped his observation. He drew them with a pencil, and afterwards the birds were curiously engraved on copper plates, at the charge of his widow, and printed with his ornithology, under the title of "Francisci Willoughbei de Middleton, Armigeri, e Reg. Soc. Ornithologiæ Libri tres, in quibus Aves omnes hæcenus cognitæ, in Methodum naturis suis convenientem redactæ, accurate describuntur: Descriptiones iconibus elegantissimis et vivarum Avium similibus, æri incis, illustrantur. Totum opus recognovit, digessit, supplevit, Joh. Raius." Mr. Ray made considerable additions and improvements to Mr. Willoughby's materials, and afterwards translated it into English, and caused it to be printed in 1678. This work of Mr. Willoughby is divided into three books, which are subdivided into chapters. In these he treats of the form and external structure of birds, of their organisation and internal structure. In one part are included twenty-four queries, the answers to which, if founded in fact, and drawn up

with judgment, would not fail greatly to contribute to the advancement of ornithology. The author recognizes the grand division of terrestrial and aquatic birds, comprising under the former those which live at a distance from water, and under the second those which live on the margin, or surface of that element. He then institutes his leading distinction from the form of the bill and feet, and would doubtless have accomplished a complete arrangement had he uniformly adhered to the same principle; but, in compliance with the prejudices of his time, he assumes the different kinds of food, the varieties of size, the nature of the flesh, and even what he called the moral qualities, as the grounds of subdivisions. His second and third books contain the description and history of the species. To the exposition of each genus are prefixed general observations, including the fabulous accounts of the ancients, and then such common properties as appertain to the genus. The author then proceeds to the specific details, stating the most important particulars with precision, and finishes with an account of peculiar habits. Mr. Ray drew up a Synopsis of Birds and Fishes, which was published after his death by Dr. Derham, with the title "Joannis Raii Synopsis methodica Avium et Piscium; Opus posthumum, quod vivus recensuit et perfecit ipse insignissimus Autor: in quo multas species, in ipsius Ornithologiâ et Ichthyologiâ desideratas, adjecit, &c. Iconibus." The figures here referred to are contained in four plates, of which two represent Indian birds about Fort St. George, and the others fishes discovered on the coasts of Cornwall, by the Rev. George Jago. In the Synopsis the author follows, with a few exceptions, the method of Willoughby, referring at the same time to the tail, feathers, and some parts of the internal conformation.

Jacob Theodore Klein published at Lubeck, in 1750, a quarto volume, entitled "Historiæ Avium Prodrömus cum prefatione de ordine animalium in genere." In this work he divides birds into families, orders, and tribes. According to his system the eight families are distinguished by the conformation of the feet: the orders by the form of the bill: and the tribes sometimes by the form and proportions of the head, and sometimes by accidental differences of the bill. Two years after the publication of Klein, we had the scientific catalogue of Mœhring, physician to the prince of Anhalt. His classes, orders, and genera, are founded on the formation of the feet and bill; and his descriptions of birds, examined by himself, are thought to be very accurate; but for want of a discriminating judgment, he is misled by the errors of others.

Of our great naturalist Linnæus we shall speak hereafter: to him has been assigned the date of 1766, the year in which he published the 12th edition of his *Systema Naturæ*.

M. Salerne, a physician of Orleans, left behind him a manuscript treatise on ornithology, which was published by his friends. He follows Mr. Ray's method, but the historical part is from the pen of Salerne. The typography is executed with neatness and elegance, and the plates, thirty-one in number, are engraved with uncommon skill.

The System of Ornithology by M. Brisson, in French and Latin, is comprised in six volumes, quarto. He distributes birds into 26 orders, instituted from the form of the feet, bill, &c.; 115 genera, which are determined by the peculiarities of the bill or mandibles, and about 1300 species. Each article is preceded by a numerous and accurate list of references and figures; many species, till then undescribed, are particularized; and the work is illustrated with more than 220 excellent engravings. The principal merit of

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Briffon's plan consists in the adoption of external and permanent characters, which enable the student to assign the name and station of a bird which he sees for the first time. This work is said to be equally accurate with that of Willoughby, and much more copious; and though not free from errors, holds a respectable rank in the library of the ornithologist.

The Natural History of Birds by the Comte de Buffon, and his learned friends, is defective in arrangement, but the style of the work is popular, luminous, and even elegant, and the plates add greatly to its value. "It possesses many qualities that recommend it to public attention: it exhibits a clear and comprehensive view of the knowledge to be acquired in ornithology, scattered through a multiplicity of volumes, and in various languages: it discusses and elucidates, with much critical accuracy, the numerous controverted points: it reduces the whole to simplicity, order, and elegance; and by large additions of valuable matter, it greatly extends the bounds of the science." Such is the opinion of the translator respecting the value of M. Buffon's Natural History. Although the whole work commonly goes under the name of Buffon, yet he derived very important assistance from his friends. The learned and eloquent M. Gueneau de Montbeillard composed the greater part of the two first volumes of the History of Birds, which appeared, in 1771, under the name of M. de Buffon, and the public did not discover the difference of style which might have been expected in the writings of different authors. It was, however, thought proper to throw off the mask, and in the subsequent volumes each author prefixed his name to his own articles. The third volume was nearly completed when new assistance was received from the communications of the celebrated Bruce, who on his return from his travels passed some days with M. de Buffon at Paris. Sonnini's edition of Buffon's Natural History contains many valuable additions, and forms, perhaps, one of the most complete works of the kind that has yet appeared. In the ornithological department, it gives descriptions and figures of every bird to which the editors could have access, either in the living or preserved state, or of which they could obtain good drawings.

The ornithology of the *Encyclopédie Methodique*, by M. Mauduyt, is celebrated on account of the preliminary discourses, the accuracy of the descriptions and references, and the correct execution of the plates. In the year 1773

Mr. Pennant published a small volume, entitled "Genera of Birds." In the preface to this work he enters into a minute account of the external parts of birds, their feathers, flight, modification, &c. With respect to the systematic arrangement he gives a decided preference to that of Ray, which he says is so judicious, that it appears scarcely possible to make any change in it for the better. In speaking of the Linnæan classification, he says; "I permit the land-fowl to follow one another, undivided by the water-fowl, the Grallæ and Anseres of his system; but in my generical arrangement, I most punctually attend to the order he has given in his several divisions, excepting in those of his Anseres and a few of his Grallæ. For, after the manner of Briffon, I make a distinct order of water-fowl with pinnated feet, placing them between the waders, or cloven-footed water-fowl, and the web-footed. The ostrich, and land-birds with wings useless for flight, I place as a distinct order. The trumpeter, or Psophia of Linnæus, and the bustards, I place at the end of the gallinaceous tribe: all are land-birds; the first multiparous, like the generality of the gallinaceous tribe; the last granivorous, swift runners, avoiders of wet places; and both have bills somewhat arched. It must be confessed, that both have legs naked above the knees; and the last, like the waders, lay but few eggs. They seem ambiguous birds, that have affinity with each other, and it is hoped that each naturalist may be indulged the toleration of placing them as suits his own opinion."

In 1781 Mr. Latham commenced his General Synopsis of Birds, a work of much accurate detail, and extending to six quarto volumes, with two of supplement. He adheres, with few exceptions, to the Linnæan genera, and illustrates each genus by one coloured copper-plate engraving, usual of some rare species. Mr. Latham was likewise the author of an "Index Ornithologicus," in two volumes quarto, which forms a convenient appendage to his larger work. The works of this able and industrious author constitute a precious repository of descriptions and facts, and must always hold a distinguished place in the library of the ornithologist. Having said thus much of our own most distinguished naturalists in this department of science, we shall give, in a tabular view, their modes of classification, that the reader may, with a glance of his eye, almost compare them with one another.

In the Linnæan system there are six orders of birds, viz.	<div> <div>Accipitres.</div> <div>Picæ.</div> <div>Anseres.</div> <div>Grallæ.</div> <div>Gallinæ.</div> <div>Passeres.</div> </div>	According to Pennant there are nine orders, in two divisions, which answer to the six of Linnæus, as in the sub-joined method.	<div> <div>Division I.</div> <div>Land Birds.</div> <div>Division II.</div> <div>Water Fowl.</div> </div>	<div> <div>Division I.</div> <div>Order I. Rapacious -</div> <div>II. Pies -</div> <div>III. Gallinaceous -</div> <div>IV. Columbine -</div> <div>V. Passerine -</div> <div>VI. Struthious -</div> <div>Division II.</div> <div>VII. Cloven-footed, } or Waders }</div> <div>VIII. Pinnated-feet -</div> <div>IX. Web-footed -</div> </div>	which answer to the Linnæan	<div> <div>Accipitres.</div> <div>Picæ.</div> <div>Gallinæ.</div> <div>Passeres.</div> <div>Passeres.</div> <div>{ Gallinæ.</div> <div>{ Grallæ.</div> <div>Grallæ.</div> <div>{ Anseres.</div> <div>{ Grallæ.</div> <div>{ Anseres.</div> <div>{ Grallæ.</div> </div>

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TABLE of the Orders of Birds according to Mr. Latham.

Ind. Orn.	Syn. of Birds.
Div. I.	Div. I.
I. Accipitres - - -	Rapacious.
II. Picæ - - -	Pies.
III. Passeres - - -	Passerine.
IV. Columbæ - - -	Columbine.
V. Gallinæ - - -	Gallinaceous.
VI. Struthionæ - - -	Struthious.
Div. II.	Div. II.
VII. Grallæ - - -	Waders.
VIII. Pinnatipedes - - -	Pinnated-feet.
IX. Palmipedes - - -	Web-footed.

For another mode of classification we refer our readers to the eighth volume of this work, under the title *CLASSIFICATION of Animals for Comparative Anatomy*. It is not necessary in this place to enumerate the genera under their respective orders, inasmuch as they differ but little in the several systems. It may, however, be observed, that the *Lanius*, which by Linnæus is placed last among the Accipitres, is by Pennant and Latham put first among the Picæ: the genera *Struthio* and *Didus*, arranged with the order Gallinæ in the Linnæan system, make a distinct order with Pennant, entitled *Struthious*; whereas Latham considers them only as part of an order, with which he classes, as separate genera, the *Cassuarius* or cassowary, and the *Rhea*, or American ostrich, which, as will be seen hereafter, are but species of the genus *Struthio*, in the Linnæan method. Again, Pennant and Latham devote their fourth order to the genus *Columba* of Linnæus, who considers it only one of seventeen of the Passerine tribe. So that, as is seen in the table, the order Passeres of Linnæus includes the Columbine and Passerine orders of the other naturalists, who likewise include the Gallinæ of Linnæus in their Gallinaceous and Struthious, and the Grallæ are likewise divided among four of their orders, some being placed with the Struthious; some with the Waders; some with those that have Pinnated-feet; and some among the Web-footed. The reason of these changes is obvious: the Swedish naturalist distinguishes his orders chiefly by the form of the *bill*, but our countrymen separate them from one another according to the characteristic form of their feet. It may be farther observed, that Pennant makes no distinction in his ninth order, the web-footed birds, but Latham divides them into two sections, *viz.* those with *long*, and those with *short* legs, in the former he places the *Recurvirostra*, the *Curirra*, and the *Phœnicopterus*. Pennant, in his Ornithology, divides all birds into 95 genera, but Latham makes 101, whereas Linnæus includes them all in 90 genera.

Such are the outline of, and distinction between, the several systems usually referred to as standards in this country, and which, on that account, we have been particular in explaining.

We may now briefly mention some other writers in this branch of science. Francis Hernandez, a Spanish physician, of whom we have in the proper place given an account, described the birds of Mexico. His work consists of 229 chapters, each of which generally treats of a single species. They are designated only by their Mexican names, and described with so much brevity, that their precise stations in the Linnæan arrangement can scarcely be ascertained. The same objections apply with equal force to a work of Nie-remberg, who has described the birds of the same country. From both, however, it has been inferred, that the feathered tribes in Mexico are numerous, and diversified with the most

brilliant colouring. The birds of Brazil present a still more rich and splendid field for the researches of the ornithologist, and of these a great number have been described by George Marcgrave, or, as he is designated in our 22d vol. MARCGRAF: but whatever he may have been as a delineator of botanical subjects, his plates in ornithology are badly executed, and very frequently they do not correspond with the descriptions. See MARCGRAVIA.

Sir Hans Sloane, who was the associate and friend of Boyle and Ray, published in 1707 the first volume of his History of Jamaica, but the second did not make its appearance till the year 1725. In this history he has given representations of 44 species of birds, but no great reliance can be placed on the accuracy of his delineations.

Mr. Mark Catesby, of whom we have given a pretty full account in the 7th volume of the *Cyclopædia*, published an excellent description of the birds of Carolina, Florida, and the Bahama islands, in French and English: it makes a large portion of "The Natural History, &c." referred to in the article already noticed: the first volume, and part of the appendix to the second, are devoted to ornithological subjects. The descriptions are concise and perspicuous, and accompanied with some interesting notices relative to the manners and habits of the species described. The plates, which are numerous, are generally faithful representations of the originals, and admirably coloured.

Schwenckfel, who published his Natural History of Siberia in the year 1603, includes birds in his fourth book. The introduction to this work is followed by the enumeration of birds in alphabetical order, according to their Latin names. His description of the parts which belong to birds in common with other animals, and of the appropriate parts of the organization of the former, are neat and accurate, but his differences, founded on habitation and food, are not at all to be depended upon. "The descriptions, though accurate, are for the most part too short, and though adequate to recall a bird already known, are not sufficient to convey a precise notion of those which are described for the first time."

M. Brunnick, in 1764, published an account of the birds of Denmark, and the neighbouring islands and provinces, but he chiefly dwells on the rare and non-descript species. He generally follows the Linnæan nomenclature, and sometimes the synonymy of Brisson.

M. Sonnerat published, in 1776, an account of his voyage to New Guinea, the Molucca, and the Philippine islands, the Isle of France, &c. and in 1783 he gave a narrative of his second voyage to several parts of the East Indies and China. This very intelligent traveller exhibits a considerable share of accuracy and taste; and besides correcting the errors of those who had preceded him, he has noticed a considerable number of birds for the first time, and most of them remarkable for their singularity and beauty. His account of the wild cock and hen, the origin of our common domestic fowls, is a very interesting article.

John Leonard Frisch, a German naturalist, was, as we have seen, author, among many other works, of one entitled, "A Representation of the Birds of Germany, with a few of foreign Countries, coloured after Nature." This work consists chiefly of European birds, arranged in twelve classes according to distinctions, which are far from precise and convenient. In addition to what has been said in the article FRISCH, (which see,) may be added, that the figures are, for the most part, accurate and lively representations from nature, though, in a few instances, they are larger than life. The author has bestowed uncommon pains on the different colourings of the two sexes of the same species.

ORNITHOLOGY.

M. le Vaillant, author of *A Voyage to the Cape*, and of the "Natural History of Birds of Africa," is eminently distinguished by the ardour and acuteness with which he has prosecuted his ornithological researches, and has availed himself with laudable diligence of his opportunities of collecting accurate details relative to the several species which he undertakes to illustrate. His "Natural History of the Birds of Paradise, Rollers, Toucans, and Barbets," is reckoned the most splendid publication that has appeared in any of the departments of ornithology. His work is thus described; "The figures, about 100 in number, are engraved by Pèrèe, from the drawings of Barraband, coloured by Langlois, and retouched by the pencil of the original designer; while the elder Didot has executed the typography in his best style, on vellum paper. Each figure is as large as life, and is usually drawn from a specimen in the highest state of preservation; and in many cases, an exact representation of the female bird has also been obtained. Though the pre-eminent merit of the work consists in the figures and descriptions, it is in a few instances agreeably diversified by traits of character which the author remarked in the living bird, and by some interesting hints of a more general complexion, which his accurate and extensive observation enabled him to collect."

M. Anselme Gaëtan Desmarest has given a natural history of the genera *Tanagra*, and *Pipra* of the Passerine order: and of the genus *Todus* in the order *Picæ*, with coloured plates, from drawings by Paulina de Courcelles, the pupil of Barraband, which reflect great credit on the persons concerned in so splendid a work. The paper, type, and figures, all bespeak the admiration of the reader. The author, Desmarest, says that they have limited their descriptions to species which they have seen, and from which they have been enabled to exhibit figures. Besides descriptions and plates of the male, usually the most beautiful bird, the authors have not unfrequently represented the female, or young of the same species, or an individual as it appears in the moulting state.

The natural history of birds by Mr. George Edwards, in four volumes, 4to., which is without method, and without any reference to particular countries, contains many excellent coloured designs, and usually may be recommended for the correctness of the descriptions. The same observation applies to his "Gleanings of Natural History," of which the most considerable portion relates to birds. (See the article EDWARDS, vol. xii.) Several other writers of our own country have described and delineated the birds of this island with various degrees of merit. The ornithological part of Pennant's *British Zoology*, has always been regarded as a work of high authority; and some others must be barely mentioned before we conclude the historical part of this article, such are Hayes' "Natural History of British Birds," with their portraits accurately drawn and beautifully coloured from nature; Lord's "Natural History of British Birds;" Lewin's "Birds of Great Britain," with delineations of their eggs, in three volumes, 4to.; Walcott's "Synopsis of British Birds," in two volumes, 4to.; a work on "British Ornithology," by Mr. Graves; Mr. White's "Natural History of Selborne;" and Bewick's "History of British Birds," with figures engraved on wood, in two volumes royal octavo, 1805. The division of the last mentioned author is into British Land and Water Birds, to each of which a volume is devoted. To these may be added the Ornithological Dictionary, or Alphabetical Synopsis of British Birds, by Mr. George Montagu, in two volumes, 8vo. In this work a large portion of accurate and important information is brought within a very narrow compass.

External Characters of Birds.—The structure of birds, and their habits of life, are wonderfully adapted to the various functions which they are destined to perform. The pointed beak, the long and pliant neck, the expansive wings, the tapering tail, the light and bony feet, are all wisely calculated to assist and accelerate their motion through the yielding air. Every part of their frame is formed for lightness and buoyancy; their bodies are covered with a soft and delicate plumage, so disposed and arranged, as to protect them from the intense cold of the atmosphere through which they pass; their wings are formed of the lightest materials, and yet the force with which they strike the air is so great, as to impel their bodies forward with astonishing rapidity, while the tail serves the purpose of a rudder to direct them to the different objects of their pursuit. It is not, however, by the power of flying alone, that birds have been distinguished from the other classes of animals; a species of squirrel, denominated the *SCIURUS volans*, and the bat genus among the MAMMALIA, and the *EXOETUS volitans*, (which see,) or flying-fish, are endowed with the same faculty, though in a very imperfect degree. On the other hand, birds of the stultitious kind, as the dodo and ostrich, from their great weight, are wholly unable to ascend into the regions of the air by means of their wings. Still, however, as we have noticed, birds in their characters differ remarkably from other animals in their external structure, as they do also in their internal conformation; if they are destitute of teeth, lips, external ears, and scrotum; so likewise they have no epiglottis, no diaphragm, nor urinary bladder. (See BIRD and FEATHER.) As the slender substance of feathers is apt to be discomposed by accident, by illness, by terror, or by the excessive heat or moisture of the atmosphere, nature has made an extraordinary provision for their adjustment and preservation in a proper temperament. The animals are furnished with a gland behind, which secretes a proper quantity of oil, that can be pressed out by the bird's bill, and laid smoothly over the feathers which require to be dressed. This gland is situated on the rump, and furnished with an opening or excretory duct, about which a small tuft of feathers grow, somewhat like a painter's pencil. When, therefore, the feathers are rumpled, the bird turning its head backward, with the bill catches hold of the gland, and pressing it, forces out the oily substance, with which it anoints the disjointed parts of the feathers, and drawing them out places them in due order. Poultry that live for the most part under cover, are not furnished with so large a stock of this fluid as those birds that live in the open air. The feathers of a hen are pervious to every shower; but swans, geese, ducks, and all such as live on the water, have their feathers dressed with oil from the first day of their leaving the shell. Next to the feathers, so important to the very existence of birds, we naturally consider the other parts that have been reckoned descriptive of the generic characters of birds. The marks derived from the plumage are precarious indications of the species to which birds belong; the more important characters of them are all taken by Linnæus from the unfeathered parts; as the beak, caruncles, nostrils, and feet, and in this principle he has been deservedly followed by many other naturalists. The bill in all birds consists of two mandibles, the upper and the lower; the former is uniformly fixed, except in the genus of parrots, which have the power of moving the upper mandible at pleasure, to assist in climbing. No birds have teeth, but some have serrated mandibles, as the toucans and merganser, (see *MERGUS* and *RAMPASTOS*,) but the serræ are not immersed in sockets. In the *Falco* genus, the base of the beak or rostrum is covered with a skin called the *cere*, and
in

in the *Meleagris*, or turkey genus, it is overspread with a caraneous appendage. The nostrils of birds are generally of an oval form, placed near the base of the upper mandible: the organ of smell in gannets is said to be wanting, but in most birds it is peculiarly acute. The wings of birds in every genus excepting the *Struthious*, are adapted for flight, which is accomplished chiefly by means of the flag-feathers, denominated *remiges*. The largest of these, named the *primary*, are situated on the extremity of the wing, and are generally eight or ten in number; the *secondary* are placed nearer the body of the animal; are always shorter, and commonly of a different shape and colour. There are two species of the genus *Aptenodytes*, (see PENGUIN,) which are destitute of the flag-feathers; with them the wings perform the office of fins, in swimming and diving. The larger feathers of the tail have been denominated *retrices*, from the circumstance of their being the director or rudder of the animal in flight; for besides serving to counterbalance the fore-parts, they enable the bird to rise, descend, or turn at pleasure. They seldom exceed ten or twelve, except in the *Anas* genus, in which they are more numerous. See DUCK.

There is a considerable difference in the form of their feet, according to their manner of life. Hence the feet have obtained various technical names, as they are fitted for perching, walking, running, swimming or diving. For perching, those seem best adapted which have three toes on the anterior part of the foot, and one backward, with the two outward toes partly connected by a membrane: among walkers this membrane is not to be found. Birds chiefly used to swimming have their feet wholly palmated, or pinnated, as is the case in coots and grebes; or semi-palmated, as in the American spoon-bill. (See FULICA, COLYMBUS and PLATALEA.) The parrots, woodpeckers, and other genera addicted to climbing, have two toes forwards and two backwards. The ostrich, the swiftest of all running birds, is in this respect anomalous, having only two toes.

Without the means of conveying themselves with great swiftness from one place to another, birds could not easily subsist, the food provided for them being so irregularly distributed, that they are obliged to take long journeys to distant parts, in order to procure the necessary supplies. Hence, perhaps, the principal cause of those migrations which are so peculiar to the feathered race. (See MIGRATION.) It has been supposed that, during the long flights of birds over immense tracts of water, the means of subsistence would inevitably fail; it ought, however, to be remembered, that this objection is obviated, when we reflect upon the superior velocity with which birds are carried forward in the air, and the ease with which they continue their exertions for a much longer time than can be done by the strongest quadrupeds. The fleetest horse will scarcely run more than a mile in two minutes, and that can be continued for a short time only. In such cases an uncommon degree of exertion has always been attended with its usual consequences, debility, and a total want of power to continue the exertion; but the motions of birds are not impeded by similar causes, and they not only glide through the air with a quickness superior to that of the swiftest quadrupeds, but can continue on the wing with equal speed for a considerable length of time. If we suppose a bird to go at the rate of a mile in two minutes, and to continue that velocity 24 hours, it will in that time have gone over an extent of 720 miles, or 240 leagues, which is sufficient to account for the longest migration; and if aided by a favourable current of air, there is reason to believe, that it will perform the same journey in a much shorter space of time. For the method by which the flight of birds is performed, see the article FLYING. As birds are continually

passing through hedges and thickets, their eyes are protected from external injuries, as well as from too much light, when flying in opposition to the sun's rays, by a nictitating or winking membrane, which can be drawn over the whole eye like a curtain. This covering is neither opaque, nor wholly pellucid, but semi-transparent. By means of it the eagle is said to be able to gaze at the sun.

Of the Nutrition, Nests, Longevity, Diseases, Fertility, and general Uses of Birds, in the Economy of Nature.—Birds may be distinguished, like the animals of the class mammalia, into two kinds, or classes, viz. the granivorous and carnivorous, and there are some that hold a middle nature, and partake of both. Granivorous birds are furnished with larger and longer intestines than those of the carnivorous kind. Their food, which consists of grain of various sorts, is conveyed whole and entire into the first stomach or craw, where it undergoes a partial dilution by a liquor secreted from the glands, and spread over its surface: it is then received into another species of stomach, where it is farther diluted; after which it is transmitted into the gizzard, or true stomach, consisting of two very strong muscles, covered externally with a tendinous substance, and lined with a thick membrane of prodigious power and strength; in this place the food is completely tritured, and rendered fit for the operation of the gastric juices. (See BIRDS, *Anatomy of*.) Granivorous birds partake much of the nature and disposition of herbivorous quadrupeds. In both, the number of their stomachs, the length and capacity of their intestines, and the quality of their food, are very similar; they are likewise distinguished by the gentleness of their temper and manners. Their chief attention is directed to procuring food, hatching and rearing their offspring, and avoiding the snares of men, and the attacks of birds of prey, and other rapacious animals. They are in general so tractable as easily to be domesticated. Carnivorous birds are distinguished by the powers with which they are furnished by nature for the purpose of procuring their food. They are provided with wings of great length, the muscles which move them being proportionably large and strong, whereby they are enabled to keep long upon the wing in search of prey: they are armed with strong hooked bills, and sharp and formidable claws: their sight is so piercing and acute, as to enable them to view their prey from the greatest heights in the air, upon which they dart with inconceivable swiftness, and undeviating aim: their stomachs are smaller than those of the granivorous kinds, and their intestines are much shorter. The analogy between the structure of rapacious birds and carnivorous quadrupeds is very obvious: both of them are provided with weapons which indicate destruction and rapine; their manners are fierce and unfocial, and they seldom live together in flocks, like the granivorous tribes. When not on the wing, rapacious birds retire to the tops of sequestered rocks, or to the depths of extensive forests, where they conceal themselves in solitude. Those which feed on carrion are endowed with a sense of smelling so exquisite, as to enable them to scent putrid carcases at astonishing distances.

Most birds, at certain seasons, live together in pairs, and the union generally continues while the united efforts of both are necessary in forming temporary habitations, and in rearing their offspring. Eagles and other birds of prey continue their attachment for a much longer time, and sometimes for life. The nests of birds are constructed with so much art as to baffle the utmost exertion of human ingenuity to imitate them. The mode of building, the materials they make use of, as well as the situations they select, are as various as the different kinds of birds, and are all admirably adapted to their several wants and necessities. Birds of the same species

cies collect the same materials, arrange them in the same manner, and make choice of similar situations for fixing the places of their temporary abodes. Wherever they dispose themselves, they always take care to be accommodated with a shelter, and if a natural one does not offer itself, they very ingeniously make a covering of a double row of leaves, down the slope of which the rain trickles, without entering into the little opening of the nest that lies concealed below. In forming the nest, they make use of dry wood, bark, thorns, reeds, thick hay, and compact moss, as a foundation, and on this, as a first layer, they spread and fold in a round form all the most delicate materials, as down, wool, silk, spiders' webs, feathers, and other light substances, adapted for the purposes for which they are intended, and to the climate in which the nests are situated. Thus, the ostrich in Senegal, where the heat is excessive, neglects her eggs during the day, but sits on them in the night. At the Cape of Good Hope, where the heat is less, the ostrich, like other birds, sits upon her eggs both day and night. In countries infested with monkeys, many birds, which in other climates build in bushes and clefts of trees, suspend their nests upon slender twigs, and thus elude the utmost art of their enemies. In all cases we may observe, without entering into particulars, that the architecture of the nests of each species seems to be adapted to the number of eggs, the temperature of the climate, or the respective dimensions of the little animal's body. Small birds, whose eggs are generally numerous, make their nests warm, that the animal heat may be equally diffused, but the larger species are less solicitous in this respect. The smaller tribes also, that live upon fruit and corn, and are often regarded as unwelcome intruders upon the labours of man, use every caution to conceal their nests from the eye, while the only solicitude of the great bird is to render their refuge inaccessible to wild beasts and vermin.

As soon as the important business of nest-making is completed, the female lays her eggs, the number of which varies according to the species: some have only two at a time, others four, five, or more, up to eighteen. (See the article *EGG*.) When the eggs are laid, the male and female brood over them by turns, though this is generally the province of the female.

The term of life varies greatly in birds, and does not seem to bear the same proportion to the time of acquiring their growth, as has been remarked with regard to quadrupeds. Most birds acquire their full dimensions in a few months, and are capable of propagation the first summer after they are hatched. In proportion to the size of their bodies, they possess more vitality, and live longer than either man or quadrupeds. It is no very easy task to ascertain the ages of birds; nevertheless we have, on unquestionable authority, instances of great longevity in many of them, particularly geese, swans, ravens, and eagles; among which, eagles have been known to attain the age of sixty, seventy, eighty, or even a hundred years. The following scale has been given by Linnæus, Buffon, and other celebrated naturalists:

An eagle will live	100 years.
A raven - - -	100
A goose - - -	70
A partridge - -	25
A turtle-dove -	25
A peacock - - -	25
A pigeon from	10 to 20

Linnets, goldfinches, canary-birds, and others in a state of captivity, have been known to live many years. The longevity of birds has been imputed to the texture of their bones, the hardness and solidity of which have been assigned

as the general cause of death in other animals. Those of birds being lighter, and more porous in their conformation, present fewer obstacles to the vital powers. Hence it has been assumed that the less solid the bones are, the more distant will be the period of death.

From the great longevity of birds, it has been inferred that they are subject to a few diseases only: their annual moulting is thought to be the only one to which they are universally liable. As quadrupeds cast their hair, so all birds every year obtain a new covering of feathers: this is what is termed moulting. During its continuance, they always appear sickly and disordered; the boldest lose their courage; none produce young, and many die under the severe visitation. No feeding can maintain their strength, or preserve their powers of reproduction. The nourishment which formerly went to the production of young, is now consumed and absorbed in administering a supply to the growing plumage. The manner in which nature performs this operation is slow in its progress. When birds have attained their full size, the pen part nearest the animal grows harder and thicker in its sides, but shrinks in its diameter: in consequence of the first of these processes, it draws gradually less nourishment from the body of the animal; and by its decrease in size, it becomes loose, till it at length falls off. In the mean time, the rudiments of an incipient quill are forming; the skin becomes in shape like a little bag, which is fed from the body by a small vein and artery, and which every day increases in size, till it is protruded. While one end vegetates into the beard or vane of the feather, that part attached to the skin is still soft, and receives a constant supply of nourishment, which is diffused through the body of the quill by the artery and vein. When, however, the quill is come to its full growth, and requires no farther nourishment, the vein and artery become gradually less, till at last the small opening by which they communicated with the quill is stopped, and the circulation ceases. The quill, after it is thus deprived of new supplies, continues for some months in the socket, till at last it shrinks, and makes room for another repetition of the same process of nature. The moulting season commences at the end of summer, and the bird continues to struggle under the malady for a considerable part of the winter: then the appetite of the animal is least craving, while its provisions continue to be most scanty. It is not till the return of spring, when the feathers have attained their full growth, that the abundance of food and the mildness of the season restore it to its full vigour.

A few words on the uses of birds to the world, and its inhabitants, shall conclude this article. The rapacious kinds evidently serve the purpose of preserving the salubrity of the air, by devouring all sorts of carrion, scattered over the surface of the earth. The natural death, or accidental destruction of living creatures would communicate to the atmosphere a putrid and noxious influence, were their carcasses allowed to dissolve and mingle with the soil by the slow process of corruption. The order *Grallæ* co-operate in this employment. They destroy toads, lizards, serpents, &c, which would otherwise increase too fast; and devour their bodies, that would more or less infect the air with putrid vapours. Hence the inhabitants of Holland and of Egypt are indebted to the labours of the stork. In the latter country, which abounds with every hideous reptile that a humid soil or sultry sun can quicken into life, this favourite bird is protected, even in its wild state, by the laws of the land. The granivorous birds are also deemed of great utility in the system of nature, inasmuch as they abridge the fertility of those weeds, which emit such immense quantities

of feed, as would soon overspread the earth, and which, if left unrestrained, would infallibly overpower the more useful vegetables. Many species are useful in transporting seeds from one country to another, and thus disseminate plants more universally over the surface of the globe. Besides the uses to which the feathered tribes are subservient in the general plan of nature, we may contemplate their connection with man, and observe how far they contribute to his pleasure and advantage. It is worthy of observation, that of the vast number of birds which inhabit the globe, it has never been discovered that a single one is of a poisonous nature. They differ very much in being more or less salutary and palatable, as an article of diet; but none of them are pernicious. None of their eggs have been found to possess any noxious qualities; a circumstance well known to seafaring people and travellers, who eat freely, and without the smallest hesitation, every species of egg, without finding any inconvenience from them.

As an article of food, all carnivorous birds are avoided, though not poisonous: the piscivorous also, especially those with sharp bills, are generally disliked, though some of the young are eaten with avidity. All water-fowl are generally reckoned a heavy and rancid food: the goose and duck are probably the best, and these are greatly improved by being fed on grain, and by being restricted, as much as possible, from fishes, slugs, worms, &c. Birds that live almost wholly on insects are likewise generally avoided as an article of food; while the smaller birds, that subsist upon grain or seeds, are very much esteemed. The woodcock, the snipe, and bittern, the whole tribe called mud-suckers, are accounted a great delicacy.

It has been remarked as a matter of surprise, that so few birds have been subservient to economical uses by domestication. They are naturally shy and timid, and appear but little susceptible of attachment and obedience. Jealous of liberty, and furnished with effectual means of escape, they fly the haunts of men, and by far the greater part continues in the primitive wildness of nature. Few, even of those that we denominate domestic, discover that familiarity or affection that obtains among those quadrupeds which have given up independence for protection. Of the rapacious birds, not one species has ever been domesticated by man, excepting for the purposes of falconry; and these are always taken, when young, from the nests of the wild ones, a proof that they do not thrive and propagate in their captivity. The order Picæ, likewise, contains not one species that has ever been reduced to a domestic state; but in the order Gallinæ, we have several species which have, with great advantage, been made subservient to the purposes of domestic economy: such are the peacock, turkey, the barn-door fowl, and the Guinea hen. Of the columbine tribe, one species only has been tamed, viz. that of the common pigeon. None of the passerine or struthious orders have ever been domesticated, though many of the former are reckoned delicate food. Four species of the duck kind have been brought from their wild state to the service of man; the swan, goose, Guinea duck, and the wild duck. The Grallæ, though excellent food, have none of them been domesticated; so that it has been observed, that of four thousand different species described by Latham, not more than ten or twelve have been rendered serviceable to the human race.

ORNITHOMANCY, a kind of divination, or method of arriving at the knowledge of futurity by means of birds.

ORNITHOMANCY, amongst the Greeks, was the same with augury among the Romans. See AUGURY and OMEN.

ORNITHOPARCHUS, ANDREAS, in *Biography*, was born at Meinungen: he was master of arts, and author of the

most general and extensive treatise on practical music, that was produced in Germany after the writings of Gaffurio had appeared. His treatise was called *Micrologus* in imitation of Guido, and published at Cologn in 1535, though Walther thinks that was not the first edition. The author chiefly cites John Tinctor, Franchinus, and the tract written by our countryman John Cotton, whom he calls pope John XXII. His treatise, though the best of the time, seems too meagre and succinct to have been of great use to the students of such music as was then practised. It was, however, translated into English in 1609, seventy years after its first publication, by our countryman John Douland, the celebrated lutenist; a labour which he might have well spared himself, as Morley's Introduction, which was so much more full and satisfactory, precluded all want of such a work as that of Ornithoparchus.

ORNITHOPUS, in *Botany*, a name altered by Linnæus from the *Ornithopodium* of preceding botanists, and derived, like that, from *ορνις*, a bird, and *πους*, a foot, the legumes having a striking resemblance to the toes of many small birds. Linn. Gen. 381. Schreb. 503. Willd. Sp. Pl. v. 3. 1155. Mart. Mill. Dict. v. 3. Sm. Fl. Brit. 776. Prodr. Fl. Græc. Sibth. v. 2. 79. Juss. 361. Lamarck Illustr. t. 631. Gærtn. t. 155. (*Ornithopodium*; Tourn. t. 224.)—Class and order, *Diadelpbia Decandria*. Nat. Ord. *Papilionaceæ*, Linn. *Leguminosæ*, Juss.

Gen. Ch. *Cal.* Perianth inferior, of one leaf, tubular, with five nearly equal marginal teeth, permanent. *Cor.* papilionaceous. Standard inversely heart-shaped, entire. Wings ovate, straight, scarcely so large as the standard. Keel minute, compressed. *Stam.* Filaments diadelphous, (one simple, the other in nine divisions); anthers simple. *Pist.* Germen linear; style bristle-shaped, ascending; stigma a terminal point. *Peric.* Legume awl-shaped, round, curved, jointed, with intermediate partitions, the joints falling off separately. *Seeds* solitary, roundish.

Ess. Ch. Legume jointed, round, curved.

1. *O. perpusillus*. Common Bird's-foot. Linn. Sp. Pl. 1049. Curt. Lond. fasc. 6. t. 53. Engl. Bot. t. 369. Fl. Dan. t. 730. (*Ornithopodium minus*; Ger. em. 1241.)—Leaves pinnate. Flowers capitate, accompanied by a leaf. Legumes incurved, beaded.—Native of sandy or gravelly pastures in various parts of Europe. A most elegant little annual plant, flowering in May. The root is fibrous, but often bears little fleshy tubercles by which it is propagated, and in that case it cannot strictly be termed annual. *Stems* prostrate, much branched, from three to twelve inches long, furrowed, downy. *Leaves* pinnate, of numerous pairs of equal, elliptical, hairy, rather fleshy leaflets, with an odd one at the end. *Flowers* in small heads, on axillary stalks, with a leaf, of fewer leaflets than the others, at the summit of each common stalk, close to the flowers. The standard and wings are white, the former prettily streaked with crimson; keel greenish. *Legumes* parallel, beadlike, slightly compressed, pointed, downy, containing one seed in each of the numerous joints. There is a more luxuriant variety, whose floral leaf, as well as the flowers, are much larger than in our British kind. This is *Ornithopodium majus*, Ger. em. 1241.

2. *O. compressus*. Compressed Yellow Bird's-foot. Linn. Sp. Pl. 1049. Sm. Fl. Græc. Sibth. t. 714, unpublished. (*Scorpioides leguminosa*; Ger. em. 1241.)—Leaves pinnate. Flowers capitate, accompanied by a leaf. Legumes compressed, even-jointed, rugged, recurved.—Native of Italy, Sicily, and Greece, sometimes raised for curiosity in our gardens, where it is a hardy annual, flowering about June. Larger than the former, with which it much agrees

in general habit, but the *corolla* is entirely yellow, and the *legumes* very different, being recurved, much flattened, and formed of quadrangular closely united joints, making the outline of the margin even, scarcely at all beaded, or notched.

3. *O. durus*. Spiral Bird's-foot. Cavan. Ic. v. 1. 31. t. 41. f. 2. Willd. n. 3.—Leaves pinnate. Flowers capitate, naked. Legumes spirally recurved, nearly cylindrical, with slightly curved joints.—Native of hills in Spain, flowering in May and June. Root annual, not perennial. Stems erect, rigid, branched, three or four inches high. Leaflets usually but three or four pair, with an odd one, obtuse, thick, smooth, and glaucous. Flowers deep yellow, two or three on each stalk, unaccompanied by a leaf. Legumes spiral, slender, their joints somewhat lunate as in *Hippocrepis*.

4. *O. scorpioides*. Purslane-leaved Bird's-foot. Linn. Sp. Pl. 1049. Cavan. Ic. v. 1. 26. t. 37.—Leaves ternate, nearly sessile; the odd leaflet very large.—Differs from all the former in the great size of its terminal leaflets, and the round kidney-shape of the only pair of lateral ones. The flowers are yellow. Legumes most like those of the last species. The whole of the herbage is glaucous and rather succulent. No leaf accompanies the flowers.

5. *O. tetraphyllus*. Four-leaved Bird's-foot. Linn. Amœn. Acad. v. 5. 402. Sp. Pl. 1049. (Quadrifolium erectum, flore luteo; Sloane Jam. v. 1. 186. t. 116. f. 3.)—Leaves quaternate. Flowers solitary. Legume beaded.—Native of meadows in Jamaica, on a clay soil. This has the habit of a *Lotus*. The leaflets are obovate, emarginate, slightly downy, besprinkled with glandular dots, and grow four together at the summit of a short common footstalk. Flowers yellow, solitary, on axillary stalks, with a pair of bracteas. Legume incurved, slightly beaded, covered with resinous dots, its numerous joints tumid, and obliquely obovate. Linnæus suspected this plant might form a new genus, for which we see no other reason than its foliage; but that indeed is foreign to the nature of the other species, and in this tribe is undoubtedly very important.

6. *O. lævigatus*. Smooth Bird's-foot.—Leaves pinnate. Flowers somewhat capitate, naked. Legumes incurved, cylindrical, with obsolete joints.—Native of Europe. Gathered by the abbé Durand at Gibraltar. We have it from Jacquin's herbarium for *O. perpusillus*, with which many botanists seem to have confounded it, yet the plants are totally distinct. The present is much larger than the *perpusillus*, with narrower more distant leaflets, and only one or two flowers on a stalk, without any floral leaf. Corolla yellow. Legume much incurved, slender, nearly cylindrical, so even that the joints are hardly discernible; its surface minutely reticulated, without hairs or downiness.—It seems wonderful that authors should have overlooked this species, which was certainly unknown to Linnæus. The *Ornithopodium pusillum*, Dalech. Hist. v. 1. 487, seems intended for it, and is indeed a very good representation, the second, or smaller figure in his p. 486, being unquestionably the real *perpusillus*. The figure we have above cited for the latter in Ger. em. appears taken from Dalechamp's p. 487, but the legumes are some of them made more jointed, and the description certainly belongs to *perpusillus*, as indeed does the account in Dalechamp, p. 487. The first *Ornithopodium* of this author appears to be *Ornithopus compressus*.

ORNITHOSCOPI, ορνιθοσκοποι, in Antiquity, diviners, or soothsayers, who made predictions, and drew omens, from birds. They were likewise called *ornithomantes*, and *orneoscopi*, &c.

ORNITROPHE, in Botany, so called by Commer-

son, from ορνις, a bird, and τροφή, food, because the fruit is a favourite food of blackbirds in the isle of Bourbon, whence the French inhabitants have named the first species of this genus Bois de Merle. Juss. 247. Lamarck Illustr. t. 309. Willd. Sp. Pl. v. 2. 322. Ait. Hort. Kew. v. 2. 348.—Class and order, *Oständria Monogynia*. Nat. Ord. *Sapindi*, Juss.

Gen. Ch. Cal. Perianth inferior, of one leaf, in four deep, ovate, rather unequal segments. Cor. Petals four, roundish, with a beard or crest in the centre of their disk. Stam. Filaments eight, inserted into a glandular receptacle, thread-shaped, the length of the corolla; anthers roundish. Pist. Germen stalked, two-lobed, compressed; style one, divided; stigmas simple. Peric. Drupas two, ovate, small, slightly pulpy, each of one cell; one of them sometimes abortive. Seed. Nut solitary, obovate.

Ess. Ch. Calyx in four deep segments. Petals four. Style cloven. Germen two-lobed. Drupas two.

1. *O. integrifolia*. Entire-leaved Ornitrophe. Willd. n. 1. Lamarck fig. 1.—Leaves ternate, ovato-lanceolate, wavy, nearly entire.—Gathered by Commerçon in the island of Bourbon. A shrub, with round, smooth, knotty branches. Leaves alternate, on longish stalks, ternate; leaflets stalked, two or three inches long, nearly equal, elliptic-oblong, bluntly pointed, unequally and slightly wavy, smooth, veiny. Stipulas none. Clusters axillary, stalked, solitary, very minutely downy, their branches very short, and each bearing a tuft of small greenish flowers, on smooth partial stalks. One lobe of the germen being usually abortive, the fruit becomes a solitary pear-shaped drupa, the size of a pea.

2. *O. ferrata*. Saw-leaved Ornitrophe. Ait. n. 1. Roxb. Coromand. v. 1. 44. t. 61.—Leaves ternate, rough, ovate, pointed serrated.—One of the most common plants on the coast of Coromandel. Dr. Roxburgh observes that among the mountains it grows to a small tree, but in the low lands near the sea it is a low branching shrub, flowering during the wet season. The natives call it *Tawatiky*, and eat the fruit, which is small and red, growing in pairs, both lobes of the germen coming to perfection. The habit is much like the last, but the leaflets are strongly serrated, and the petals turned all to one side, which does not appear to be the case in that, as far as we can learn from figures or dried specimens. Some flowers want the pistil.

3. *O. Cobbe*. Ceylon Ornitrophe. Willd. n. 3. (Rhus Cobbe; Linn. Sp. Pl. 382. Kobbæ; Herm. Zeyl. 24. Linn. Zeyl. 205.)—"Leaves ternate, ovate, acute, serrated, downy beneath. Stalk of the clusters downy."—Native of Ceylon. We have seen neither specimen nor figure. Linnæus says the leaves are either ternate or quinate. His description of the inflorescence accords with both the preceding, but the common stalk seems to be more downy. The fruit is said to be black.

4. *O. Cominia*. Yellow-berried Ornitrophe. Willd. n. 4. (Rhus Cominia; Linn. Sp. Pl. 381. Schmidelia Cominia; Swartz Ind. Occ. v. 2. 667. Baccifera indica trifolia, fructu rotundo monopyreno; Sloane Jam. v. 2. 100. t. 208. f. 1.)—Leaves ternate, elliptic-oblong, unequally serrated, downy beneath. Common flower-stalks branched, downy.—Native of Jamaica; cultivated by Miller in 1759. A tree thirty feet high. Leaves dark green above; white and downy, with innumerable reticulated veins, beneath. Flowers very small, thickly set in dense hairy clusters, several of which grow on one branched downy common stalk. The fruit is described by Sloane as no bigger than a small pin's head, orange-coloured, with very little pulp. *Molago Maram*, Rheede Hort. Malab. v. 5. 49. t. 25, quoted for this species by Linnæus, has whitish fruit, and more distant flowers,

flowers, otherwise they seem nearly allied; but we have reason to think there are many species of this genus as yet undescribed by systematic writers; nor is our knowledge at present sufficient for us to settle the synonyms of those already published.

5. *O. occidentalis*. West-Indian Ornithophoe. Willd. n. 5. (*Schmidelia occidentalis*; Swartz Ind. Occ. v. 2. 665. *Alrophyllus racemosus*; Swartz Prodr. 62.)—Leaves ternate, slightly downy beneath. Clusters solitary.—Native of bushy hills in Hispaniola.—A *shrub*, nine or ten feet high, with many smooth branches. *Leaflets* nearly sessile, close together, oblong, contracted at the lower part, pointed, slightly downy beneath; the lateral ones oblique at the base. *Clusters* simple. *Flowers* white, small; on some shrubs male only.

6. *O. rigida*. Rigid Simple-leaved Ornithophoe. Willd. n. 6. (*Schmidelia rigida*; Swartz Ind. Occ. v. 2. 663. *Alrophyllus rigidus*; Sw. Prodr. 62.)—Leaves simple, with spinous teeth. Clusters solitary. Native of dry mountainous parts of Hispaniola, but extremely rare. A rigid *shrub*, with alternate, simple, stalked, lanceolate leaves, rough above, downy beneath, with strong reticulated veins, and small spinous marginal teeth. *Clusters* axillary, solitary, stalked, hairy.

After all that has been said of this genus, it is perhaps not distinct from *Schmidelia*, with which it precisely accords in habit, differing chiefly in having but one *style*, instead of two, and a *calyx* with four deep segments, instead of one of two leaves. But the twin *germen* in *Ornithophoe*, shews the former character to be but ambiguous, and the *calyx* having two larger and two smaller segments, renders the latter somewhat suspicious. See *SCHMIDELIA*.

ORNON, in *Geography*, an island in the Baltic, near the coast of Sweden. N. lat. 68. E. long. 18° 6'.

ORNOS, a sea-port on the S. coast of the island of Myconi. N. lat. 37° 24'. E. long. 25° 20'.

ORNUS, in *Botany*, the name of a plant mentioned by Virgil and Pliny; as a large and majestic tree, preferring mountainous situations. It is generally taken for the Manna Ash, or *μελισα* of Dioscorides; see *FRAXINUS Ornus*. Gesner, Ruellius, Dodonæus, and some others, have supposed our Mountain Ash, *Pyrus aucuparia*, Fl. Brit. to be the true *Ornus*. Dodonæus very rightly observes that Virgil in his *Georgics*, book 2. l. 71, speaks of it as a tree on which the pear was engrafted. This is much in favour of his opinion, though he did not deduce any argument from it. The pear is much more likely to succeed by grafting on a stock of its own natural order or genus, than on one so remotely allied as any *Fraxinus*. Virgil moreover always speaks of the majestic growth and strength of his *Ornus*, which is far more applicable to the plant of Dodonæus, Ruellius, and Gesner than to the Manna Ash.

ORO, in *Geography*, a mountain of Switzerland, in the country of the Grisons; 13 miles W. of Bormio.

ORO, *Cape d'*, the eastern point of the island of Negropont, anciently called "Caphareus," in the island of Eubœa. N. lat. 38 8'. E. long. 24° 40'.—Also, a cape on the W. coast of Africa, called "Oleredo." N. lat. 23° 30'. W. long. 15° 20'.

OROBANCHE, in *Botany*, *ὀροβανχη* of the Greeks, so called from *ὀροβος*, a *vetch*, and *αρχω*, to *strangle* or *suffocate*, because this parasite is believed to starve, or render barren, the plants on which it grows. Having been originally observed upon the Broom in England, it is here named Broom-rape. Linn. Gen. 321. Schreb. 421. Willd. Sp. P. v. 3. 347. Mart. Mill. Dict. v. 3. Sm. Fl. Brit. 668. Prodr. Fl. Græc. Sibth. v. 1. 440. Juss. 101. Tourn. t. 81.

Lamarck Illustr. t. 551. Class and order, *Didynamia Angiospermia*. Nat. Ord. *Personate*, Linn. *Pediculares*, Juss.

Gen. Ch. *Cal.* Perianth inferior, of two leaves mostly divided, lateral, sometimes combined at their base, erect, coloured, permanent. *Cor.* of one petal, ringent, withering. Tube bending, ample, inflated. Limb spreading; its upper lip concave, dilated, notched; lower reflexed, three-cleft, uneven at the margin, its segments various in size and proportion. Nectary a gland, in front, at the base of the germen. *Stam.* Filaments four, awl-shaped, concealed under the upper lip, two of them longest; anthers erect, approximated, shorter than the corolla, tumid, two-lobed and acutely awned. *Pist.* Germen superior, oblong; style simple, the length and position of the stamens; stigma drooping, thick, of two obtuse lobes. *Peric.* Capsule ovate-oblong, pointed, of one cell and two valves. *Seeds* numerous, minute. *Receptacles* four, linear, lateral, attached to the valves.

Ess. Ch. Calyx of two lateral leaves. Corolla ringent. Capsule of one cell and two valves. Seeds numerous. A gland under the germen in front.

* *Braëas* solitary.

1. *O. major*. Greater Broom-rape. Linn. Sp. Pl. 882. Sutton Tr. of Linn. Soc. v. 4. 175. Engl. Bot. t. 421. Curt. Lond. fasc. 4. t. 44.—Stem simple. Corolla inflated; the segments of its lower lip equal and acute. Stamens smooth. Style downy.—Native of Europe, in bushy places on a barren sandy soil, growing parasitically on the roots of *Spartium* or *Ulex*, and flowering in June and July. The root is supposed to be perennial, and fixes itself by numerous fleshy fibres. Whole herb of a dull purplish-brown, the corolla only when fresh being rather more purple than the rest. The stem is simple, erect, angular, downy, succulent, about a foot high, clothed with scattered, lanceolate, leafy scales, shorter and more crowded about the bottom, which assumes a swelling ovate figure. Spike terminal, simple, rather close, of many flowers, each of which is accompanied by a simple lanceolate bractea. Calyx of two lateral opposite leaves, each divided more than half way down into two equal, lanceolate, acute segments. Corolla an inch long, inflated, a little incurved, keeled at the back; its upper lip entire, with a reflexed waved margin; lower in three equal, acute, dependent lobes, more or less wavy or slightly crenate; these are best represented in the dissection of the flower in Engl. Bot. and in every part of Curtis's figure. Stamens channelled and quite smooth in their lower part, though a little glandular at the very summit. Style downy throughout, with a smooth stigma of two yellow separate little globes. Every author has confounded this species with *O. major garyophyllum olens* of Bauhin's Pinax, 87, till the writer of the present article distinguished them; see the next species. Even Ray fell into this error, the true plant of Bauhin not being a native of Britain; and Curtis attributes to ours "a faint smell of cloves," which it has not, from reading in various books that such a scent belonged to *O. major*.

2. *O. caryophyllacea*. Clove-scented Broom-rape. Sm. Tr. of Linn. Soc. v. 4. 169. Willd. n. 3. (*O. major*; Pollich. Palatin. v. 2. 200. *O. n.* 295; Hall. Hist. v. 1. 129. *O. major*, *garyophyllum olens*; Bauh. Pin. 87.)—Stem simple. Corolla inflated, crisped at the edge; the segments of its lower lip equal and obtuse. Lower part of the stamens hairy on the inner side. Native of Germany, Switzerland, and Italy. Our specimens were gathered in April 1787, on shrubby hills near Valcimara, at the foot of the Apennines. This has the appearance of the former, but smells strongly like cloves, when

when fresh. It has, moreover, the three segments of the lower lip obtuse, and much more fringed and curled. The *germen* is entirely smooth, which in *O. major* is hairy in the upper part, and the *style* is much less downy than in that species. But the strongest mark of distinction is found in the copious hairs which clothe the inner side of the *stamens*, that part being always quite smooth in the *major*. The *stigma* is brown or purplish, that of the *major* yellow. We have received Swift specimens which prove this to be Haller's n. 295. That author describes a variety with a dense conical spike, a very short flower, and very prominent style, of which he had seen a drawing only. Linnæus had a specimen from Pomerania, which answers exactly to this description, and appears really to be a variety of our *caryophyllacea*, with which its *stamens* and *stigma* exactly agree. We have from Dr. Roth an Hercynian specimen, marked *O. arenaria* of Borkhausen, which is likewise our *caryophyllacea*.

3. *O. fetida*. Fœtid Broom-rape. Desfont. Atlant. v. 2. 59. t. 144. Willd. n. 2. (*O. major* β; Vahl. Symb. v. 2. 70. *O. flore specioso fimbriato ruberrimo*; Shaw Spec. n. 452.)—Stem simple. Corolla somewhat inflated; all its segments rounded, and toothed at the edge. Stamens hairy at the top and bottom. Style slightly hairy upwards.—Frequent in wild as well as cultivated ground in Barbary, in the spring. We have a specimen from M. Desfontaines. It is taller and more slender in habit than either of the former, with a long cylindrical spike. The *calyx-leaves* are split into two deep, long, and narrow, unequal segments. Corolla dark purple; its upper lip in two, and lower in three, all nearly equal rounded lobes, sharply toothed at the edge. Stamens hairy at the very base and summit only, otherwise smooth. Style, and top of the *germen*, besprinkled with hairs. The flowers are said to be fœtid, but, according to Vahl, this circumstance is variable.

4. *O. rubra*. Red Fragrant Broom-rape. Sm. Engl. Bot. t. 1786.—Stem simple. Corolla tubular, fringed; its upper lip cloven; lower in three nearly equal segments. Stamens fringed on one side at the base; germen and style at their summits. Calyx-leaves undivided.—Discovered by John Templeton, esq. a most acute and observing botanist, growing plentifully on the basaltic rock at Cave-hill, near Belfast, in August 1805. The roots creep, but do not appear to be attached to those of any other plant. Whole plant near a foot high, of a purplish-red, slightly downy. The flowers smell powerfully like a honeysuckle or pink. It seems most akin to the last, but the segments of the upper lip are considerably larger than those of the lower; all of them are minutely fringed with fine glandular hairs. The peculiar lateral pubescence of the *germen*, *style*, and *stamens*, in the parts above-mentioned, and, above all, the undivided *calyx-leaves*, distinguish this species from all the foregoing.

5. *O. carulefens*. Blueish Broom-rape. Willd. n. 4.—Stem simple. Corolla tubular. Bractæas the length of the flower, clothed, like the divided calyx-leaves, with white hairs. Stamens and style smooth.—Native of Siberia, near the Caspian sea, from whence it was sent to Professor Willdenow by his friend Stephanus. We have a specimen, gathered at Algiers by the late M. Broussonet, which answers in every point to Willdenow's description, except that the *style* and *germen* in ours are glandular. He describes his plant as having a simple stem, near a foot high, striated, downy, clothed above with white shaggy hairs, as are also its scales or leaves. Spike dense, three inches long, white in consequence of the long snowy hairs which cover the bractæas and calyx, though the flowers are blueish. Bractæas

ovate, with a taper point equal to the flowers. Calyx-leaves in two deep, unequal, awl-shaped segments, almost as long as the tube of the corolla, which is not inflated. Stamens and pistil smooth.

6. *O. comosa*. Tufted Broom-rape.—Stem simple. Corolla inflated. Bractæas hairy; the lower ones broad and ovate; the upper elongated and taper-pointed. Stamens and style smooth. We have received this from our learned friend Mr. Schmaltz of Palermo, by the name of *O. rubra*; but it is different from what we have described above under that appellation, the calyx-leaves being deeply divided. The scales of the stem, as well as the lower bractæas, are remarkably broad, obtuse, and covered externally with white shaggy hairs; while the upper bractæas are furnished with long, spreading, smooth points, and crowded into a tuft, apparently producing no flowers. The inflated corolla seems to distinguish it from the last; the lower lip is in three very obtuse, broad lobes, connected by elevated plaits.

7. *O. elatior*. Tall Broom-rape. Sutton Tr. of Linn. Soc. v. 4. 178. t. 17. Sm. Fl. Brit. n. 2. Engl. Bot. t. 568. Willd. n. 5. (*O. major*; Sibth. Oxon. 191, according to Professor Williams.)—Stem simple. Corolla tubular; the segments of its lower lip equal and acute. Stamens downy. Style smooth.—Common in fields, and about their borders, in England and Germany, especially on a gravelly soil, flowering in July and August. This is taller, and of a more yellowish hue than *O. major*, with which most botanists have confounded it, but the Rev. Dr. Sutton, by attending to the hairiness of the *stamens*, first well distinguished the present species. Its roots mostly adhere to those of *Trifolium pratense*, or *Centaurea Scabiosa*. The flowers are more copious than in any other British species, with a less turgid corolla, whose upper lip is divided, dilated, fringed, and crisped. They have no scent. The calyx-leaves are united in front. Upper part of the *stamens*, as well as the whole style and germen, very smooth. Stigma inversely heart-shaped, yellow.

8. *O. minor*. Lesser Broom-rape. Sm. Fl. Brit. n. 3. Engl. Bot. t. 422. Sutton Tr. of Linn. Soc. v. 4. 179. Willd. n. 7. (*O. major*; Loeß. Hesp. 151. *O. flore minore*; Bauh. Hist. v. 2. 781. Dill. in Raii Syn. *288. Tourn. Inst. 176.)—Stem simple. Corolla tubular; the middle segment of its lower lip lobed. Stamens fringed. Style smooth.—Abundant in fields of clover in Britain, on whose roots it grows parasitically. Loeßing gathered it on the roots of elms, in the royal gardens of Aranjuez, and his specimens are in the Linnæan herbarium. This is smaller than the last, with fewer and smaller flowers, whose calyx-leaves are distinct, and variable in shape, being sometimes undivided. The *stamens* are merely fringed at their edges. Stigma dilated, purple. The middle segment of the lip being larger, and mostly three-lobed, is a strong character. The colour of the whole plant is usually purplish, but there is a variety with pale yellow flowers, resembling the *Monotropa* in hue.

9. *O. alba*. White Broom-rape. Willd. n. 8.—Stem simple. Corolla tubular, toothed; its lower lip in three rounded, nearly equal segments. Stamens slightly fringed below. Style hairy upwards. Calyx-leaves undivided, combined.—Native of Siberia, near the Caspian sea. Stem half a foot high, tawny and hairy. Spike about two inches long, the lower flowers remote. Bractæas ovate, acute, hairy, rather exceeding the calyx, whose segments are undivided, combined at their base. Corolla cylindrical, the size of the last, white, clothed with glandular hairs. Upper lip inversely heart-shaped, toothed; lower as above described. Filaments smooth, dilated at the base, where they are

are furnished with a few glandular marginal hairs. *Germen* smooth. *Style* smooth, clothed with glandular hairs in the upper part. *Stigma* large, two-lobed. *Willd.* We have seen no specimen.

10. *O. gracilis*. Slender-stalked Broom-rape. Sm. Tr. of Linn. Soc. v. 4. 172. Willd. n. 9.—Stem simple. Corolla inflated; its lower lip very short, the segments inversely heart-shaped, unequal, crisped and jagged. Stamens and style loosely hairy, prominent.—Gathered by the writer of this, in July 1787, in hilly pastures at St. Orlese near Genoa. Dr. Noehden found the same high on the Pyrenées. This is of a more slender habit than any of the above, and is from one to two feet high. The large inflated *corolla*, and short lower lip, essentially distinguish it from *O. minor*, as well as the hairy *style*, and greater length of the *stamens*. We do not recollect the plant's having when fresh any peculiar smell.

11. *O. cernua*. Drooping-flowered Broom-rape. Linn. Sp. Pl. 882. Loeffl. Hist. 152, excluding the synonyms.—Stem simple. Corolla tubular, bent downward; its upper lip divided; lower in three equal rounded segments, flat. Stamens slightly fringed at the base. Style smooth, incurved.—Gathered by Loeffling, whose specimen is before us, on the roots of *Artemisia campestris*, in very barren fields at Aranjuez in Spain. Stem about six inches high. *Spike* lax, of about a dozen smooth pale flowers, with a purple limb, remarkable for the strong curvature in their tube, by which the mouth is turned directly downwards. The *bractæas* are broad, ovate, ribbed and downy. *Calyx-leaves* ovate, inflated; those of the lower flowers entire, of the upper usually cloven. *Stamens* and *style* strongly incurved. Can this be the *O. media*, Desfont. Atlant. v. 2. 59?

12. *O. americana*. American Broom-rape. Linn. Mant. 88. Willd. n. 10.—Stem simple. Scales imbricated, smooth, Corolla tubular, bent downward; its upper lip vaulted; lower in three equal oblong segments. Stamens and style incurved, very smooth. Calyx simple.—Sent by the late Dr. Garden, from South Carolina. The whole plant is remarkably smooth, yellow, a span high. Scales closely imbricated, polished, pale, ovate. *Spike* dense, of numerous flowers, smaller than any of the foregoing, and deflexed as in the last. *Bractæas* lanceolate, pale and smooth like the scales of the stem. *Calyx* of one leaf, scarcely divided.

13. *O. virginiana*. Virginian Broom-rape. Linn. Sp. Pl. 882. Willd. n. 11. (*O. minor virginiana* lignosior, per totum caulem floribus minoribus onusta; Morif. v. 3. 502. sect. 12. t. 16. f. 9.)—Stem branched. Corolla tubular; its lower lip in three equal acute segments. Calyx simple, four-toothed. Capsule globose.—Gathered by Bannister and Kalm in Virginia. This is widely different from all the foregoing, in its slender much-branched stem, and small, racemose, numerous, rather distant flowers. The *bractæas* are small and ovate, about as long as each partial flower-stalk. *Calyx* hemispherical, with four teeth. Corolla slender, somewhat incurved, about half an inch long; its lips small, the upper vaulted. Style prominent, with a capitate, scarcely lobed stigma. The *stamens* we have no opportunity of examining.

14. *O. purpurea*. Purple Cape Broom-rape. Linn. Suppl. 288. Willd. n. 6.—Stem simple, racemose. Corolla tubular; its limb in four rounded equal segments. Calyx simple, five-cleft. Anthers curved, with a double spur at their base.—Gathered at the Cape of Good Hope by Thunberg. This appears to us very improperly referred to the genus in question, with which its *calyx* and *corolla* by no means agree. We have not sufficient materials to fix it

firmly elsewhere. The plant is a foot high, nearly leafless, downy, purple, turning black in drying. Corolla an inch and a half long, curved, taper at the base. Flower-stalks about as long as the corolla, with an oblong bractea at the base of each.

* * Bractæas three together.

15. *O. carulea*. Purple European Broom-rape. Villars Dauph. v. 2. 406. Sm. Fl. Brit. n. 4. Engl. Bot. t. 423. Sutton Tr. of Linn. Soc. v. 4. 182. Willd. n. 13. (*O. purpurea*; Jacq. Austr. t. 276. O. Gmel. Sib. v. 3. t. 46. f. 1. O. n. 294; Hall. Hist. v. 1. 129. O. quarta; Lob. Ic. v. 2. 269. O. secunda; Clus. Hist. v. 1. 271. O. flore majore; Ger. em. 1312.)—Stem simple. Bractæas ternate. Upper lip of the corolla divided and notched.—Native of grassy pastures near the sea, at Montpellier, as well as in Hampshire and Norfolk. It is also found in Austria, Siberia, and Switzerland. This species flowers with us in July. It is rare, and its synonyms have been very much misunderstood. Linnæus, who did not know the plant, confounded its history with that of a Siberian *Lathræa*, under the name of *O. levis*, which appellation it was impossible to retain for the present plant, and therefore the above was chosen. The habit is more slender, and less pubescent, than any of our three British species in the first section, the colour more dark and violet; the flowers longer. The bractæas are three, one large and external, two smaller, internal. Calyx tubular at the base, the leaves being united; their lobes in two nearly equal awl-shaped segments. Corolla palish violet, ribbed, tubular much longer than the bractæas; its upper lip ascending, more or less deeply two-lobed, with a notch or two between the lobes; lower of three equal, ovate, entire, dependent lobes, not undulated, the palate elevated, divided, white and downy. Stamens entirely smooth. Germen smooth; style a little downy. The *Orobanche* of Besl. Hort. Eyf. æt. ord. 7. t. 2, cited by Bauhin under his *O. flore majore*, (see Tr. of Linn. Soc. v. 4. 167) appears intended for the species before us, though bad, and perhaps imitated from old wooden cuts. It is scarcely possible that this or any *Orobanche* should have been cultivated in the garden at Aichstat, though it might grow in the neighbouring fields. The history of the confusion between this plant and the *Orchis abortiva* of Linnæus, which gave rise to the report of the latter growing in Hampshire, is given at length by the writer of the present article, in Tr. of Linn. Soc. v. 4. 164. The reader may also consult Sm. Fl. Brit. 927.

16. *O. ramosa*. Branched Broom-rape. Linn. Sp. Pl. 882. Sm. Fl. Brit. n. 5. Engl. Bot. t. 184. Sutton Tr. of Linn. Soc. v. 4. 185. Willd. n. 17. Ger. em. 1312. (O. n. 296; Hall. Hist. v. 1. 130. O. Camer. Epit. 311.)—Stem branched. Bractæas ternate. Upper lip of the corolla in two rounded entire segments. This grows amongst Hemp, to which plant its roots are attached, and whose seeds it is supposed to render abortive. It occurs in various parts of Europe, flowering in the latter part of summer. This is more nearly allied to the last, and to *O. cernua*, than any other. With *carulea* it agrees in having a pair of internal bractæas, but the stem, being invariably more or less branched, except occasionally perhaps in a very poor starved specimen, distinguishes it from all except the *virginiana*, and with that it has few characters in common besides. The *ramosa* is of a brighter purple hue in its flowers than any other British *Orobanche*, and in Greece the colour is still more vivid, and the plant very beautiful as well as luxuriant. The segments of the corolla are more equal and rounded than in *carulea*, nor are there any intermediate teeth or notches

notches in the upper lip. The *root* of the specimen figured in Engl. Bot. is diseased and swollen, in consequence of the attacks of some insect, probably a *Cynips*.

*** *Bractæas none*.

17. *O. uniflora*. Single-flowered Broom-rape. Linn. Sp. Pl. 882. Willd. n. 12. (*Gentianella minor aurea*, flore singulari amplo deflexo pallide flavescente; Pluk. Mant. 89. Phyt. t. 348. f. 3.)—Stems single-flowered. Calyx without any bractea.—Native of Maryland and Virginia. The *root* is smooth, somewhat creeping, branched, thick, but short, furnished with rounded alternate *scales*, and perhaps ought to be reckoned a partly subterraneous stem. From within each of the scales springs a solitary, erect, round, simple, naked *stem* or *stalk*, four or five inches high, rather downy, especially upward, bearing one large rather drooping *flower*, of the same yellowish or purplish hue as in several of the other species. The *calyx* is bell-shaped at the base, the leaves being united; but whether there are four segments or five, our specimens are not in a condition to shew. *Corolla* above an inch long, ribbed, downy; its upper lip in two deep, rounded, obtuse lobes; lower in three similar equal lobes; all finely fringed with glandular hairs. *Stamens* and *style* much shorter than the corolla, all smooth, at least in their upper half. Plukenet's figure represents the *corolla* as with only four segments; hence Willdenow refers this species to his first section; but his mode of subdividing the genus is very exceptionable.

Willdenow unites with this genus the *Phelypæa* of Tournefort and Desfontaines, which we cannot but consider as well distinguished by the five deep rounded segments of its *calyx*, to say nothing of the habit. See *PHELYPÆA*.

Æginetia, published by Linnæus in the first edition of Sp. Pl. but referred to *Orobanchæ* in the second, is well restored by Dryander in Roxb. Coromand. v. 1. 63. t. 91, and by Willdenow, Sp. Pl. v. 3. 347. Its *calyx* is of one leaf, bursting laterally, and the *capsule* of numerous cells.

OROBROIDES, a name given by Hippocrates, and other authors, to a furfuraceous sediment in the urine of persons who have the jaundice: it is usually of a reddish-brown colour; and is not peculiar to that disease, but is found in some others.

OROBUS, in *Botany*, a name borrowed from the Greeks, whose *οροβος*, however, is generally supposed to be the *Ervum*, or Tare, of the Latins, a very different genus from what we now call *Orobus*. Ambrosinus derives the word from *ορω*, to excite, and *βας*, an ox, because horned cattle, feeding upon this plant, thrive, and grow courageous, or prone to combat. Linn. Gen. 374. Schreb. 496. Willd. Sp. Pl. v. 3. 1072. Mart. Mill. Dict. v. 3. Sm. Fl. Brit. 761. Prodr. Fl. Græc. Sibth. v. 2. 63. Juss. 360. Tourn. t. 214. Lamarck Illustr. t. 633. Gært. t. 151.—Class and order, *Diadelphica Decandria*. Nat. Ord. *Papilionaceæ*, Linn. *Leguminales*, Juss.

Gen. Ch. *Cal.* Perianth inferior, of one leaf, tubular, obtuse at the base; its orifice oblique, with five very short teeth; the three lowermost sharpest; the two uppermost shortest, most deeply and obtusely divided; withering. *Cor.* papilionaceous. Standard inversely heart-shaped, reflexed at the summit and sides, longer than the other petals. Wings two, oblong, nearly equal to the standard, ascending, cohering together. Keel manifestly divided below, pointed, ascending; its margins parallel, cohering, compressed; tumid in front. *Stam.* Filaments in two sets, one simple, the other in nine divisions, curved upwards; anthers roundish. *Pist.* Germen cylindrical, compressed; style thread-shaped, bent upwards, erect; stigma linear, downy at the inner side

from the middle to the top of the style *Peric.* Legume round, long, with a sharp ascending point, of one cell and two valves. *Seeds* numerous, roundish.

Eff. Ch. Style linear, roundish, downy above. Calyx obtruse at the base; its two upper segments deepest and shortest.

1. *O. lathyroides*. Upright Blue Bitter-vetch. Linn. Sp. Pl. 1027. (*Lathyroides erecta*, &c.; Amman. Ruth. 114. t. 7. f. 2.)—Leaves in pairs, elliptical, nearly sessile. Stipulas toothed.—Frequent throughout Siberia in open mountainous grassy pastures, flowering in June and July. Sibthorp gathered it on mount Athos. Miller is said to have cultivated it formerly. We saw the plant in flower at Messrs. Lee and Kennedy's in 1809, but it is of rare occurrence in gardens, though worthy of notice on account of its beautiful tufts, or short clusters, of blue *flowers*, which partake of the elegance of form, and variegation of colour, proper to this genus. The *root* is perennial. *Stems* upright, simple, leafy, a foot and half high. *Leaves* alternate, of two light-green, elliptical, more or less blunt, entire, smooth leaflets, above an inch long, reticulated with copious veins, nearly sessile, with a minute bristle between them. *Stipulas* broadish, half-arrowshaped, variously toothed. *Flower-stalks* axillary, solitary, shorter than the leaves, bearing a cluster of eight or ten inodorous *flowers*, all turned one way. The *calyx* is purplish, slightly hairy. *Claws* of all the *petals* pale. Summit of the *keel* and *wings* of a beautiful blue, with darker veins. *Seeds* four or five, in a long narrow *legume*, with spiral valves.

2. *O. hirsutus*. Hairy Bitter-vetch. Linn. Sp. Pl. 1027. Sm. Fl. Græc. Sibth. t. 690, unpublished. (*O. sylvaticus*, foliis circa caulem auriculatis; Buxb. Cent. 3. 22. t. 41.)—Leaves in pairs, ovate, stalked. Stipulas entire, nearly as big as the leaflets.—Native of shady woods in Thrace, flowering in May; *Buxbaum*. Sibthorp gathered it on Parnassus, Hæmus, and the Sphaciot mountains of Crete. The *stems* are much taller than in the last, and branched, but weak and trailing. *Leaflets* not half so large, acute, with parallel veins, fringed at the edges, and supported by a common *stalk* near an inch long, at whose base stands a pair of large *stipulas*, much like the leaflets, but elongated into an acute point at the base. Common *flower-stalks* three or four times as long as the leaves, hairy, each bearing but two or three rather large pea-like *blossoms*, whose *calyx* is hairy, with long taper teeth, the *standard* of a light violet blue, the *wings* paler, and *keel* nearly white. This species has not as yet been seen in our gardens.

3. *O. luteus*. Yellow Bitter-vetch. Linn. Sp. Pl. 1028. (*O. montanus*; Scop. Carn. v. 2. 60. t. 41. *O. n.* 17; Gmel. Sib. v. 4. 13. t. 4. *O. n.* 419; Hall. Helvet. v. 1. 182. *O. pannonicus* quartus; Clus. Pann. 741. Hist. v. 2. 231. *O. montanus*, flore albo; Ger. em. 1248. *Galega montana*; Dalech. Hist. 1139.)—Leaves pinnate, with about five pair of elliptic-lanceolate leaflets. Stipulas half-arrowshaped, toothed.—Native of the Alps and Pyrenæes, as well as of mountains in Hungary, and about rivers in Siberia, flowering in May. Dr. Sibthorp gathered it on the Bithynian Olympus. We have seen it cultivated by the present Bishop of Carlisle at Ealing, and occasionally elsewhere, nor can we help regretting that so fine a plant, which Haller says is one of the most handsome of the papilionaceous tribe, and with whose figure and description in Clusius and his followers he justly finds fault, has not appeared in our periodical works, instead of useless repetitions of well-known species, or trifling varieties. The *root* is certainly perennial, not annual. *Stems* annual, numerous, two or three feet high, sometimes simple, but mostly branched, leafy; angular.

Leaves

Leaves of four or five pair of elliptic-lanceolate bristle-pointed leaflets, glaucous beneath, an inch and half long, with a small linear-lanceolate terminal bristle, or abortive leaflet. *Flower-stalks* longer than the leaves, each bearing from six to ten large drooping *flowers*, tinged with various shades of pale yellow and buff-colour. Clusius calls them white, and the root annual. The figure in Dalechamp is better than his, but Gmelin's is the best. Miller's t. 193. f. 1. describes the flowers as purple.

4. *O. vernus*. Spring Bitter-vetch. Linn. Sp. Pl. 1028. Curt. Mag. t. 521. (*O. venetus*; Clus. Hist. v. 2. 232. Ger. em. 1247.)—Leaves pinnate, with about three pair of ovate taper-pointed leaflets. Stipulas half-arrow-shaped, entire. Stem simple.—Native of mountainous woods, chiefly in the northern parts of Europe, though Dr. Sibthorp gathered it on mount Athos and the Bithynian Olympus. With us it is only a garden plant, but a very pretty one, conspicuous in April or May for its broad bright-green leaves, and copious showy *flowers*, variegated with crimson and blue. A little shelter secures its beauty in the fickle spring of our climate.

5. *O. tuberosus*. Common Bitter-vetch, or Heath Pea. Linn. Sp. Pl. 1028. Sm. Fl. Brit. n. 1. Engl. Bot. t. 1153. Curt. Lond. fasc. 1. t. 53. Fl. Dan. t. 781. (*Astragalus sylvaticus*; Ger. em. 1237.)—Leaves pinnate, with about three pair of elliptic-lanceolate leaflets, stipulas half-arrow-shaped, toothed at the base. Stem winged.—Native of pastures, woods and thickets, on a strong soil, in the north of Europe more especially. The roots are knobbed and perennial, much esteemed by the Scottish Highlanders, for their sweet taste and nutritious qualities. The herb is about a foot high, with dark-green leaflets, which vary in breadth, and are sometimes found quite linear. The *flowers* are racemose, large and handsome, with a brownish and glaucous calyx, a standard elegantly varied with purple, crimson and blue, and pale wings.

6. *O. albus*. White Austrian Bitter-vetch. Linn. Suppl. 327. Willd. n. 6. (*O. pannonicus*; Jacq. Austr. t. 39.)—Leaves pinnate, with two pair of linear leaflets. Stipulas half-hastate, lanceolate, entire. Stem without wings.—Native of Austria and Hungary. The root is perennial, furnished with many cylindrical knobs. Stem simple or branched, a foot or two high, angular, without wings. Leaflets two inches long and about a line wide, two pair on each common stalk. Stipulas lanceolate, entire, each with a small horizontal lobe at the base. Clusters on long stalks of about four white *flowers*, the size of the last. Legume compressed.

7. *O. angustifolius*. Siberian Narrow-leaved Bitter-vetch. Linn. Sp. Pl. 1028. Gmel. Sib. v. 4. 14. t. 5.—Leaves pinnate, with two pair of linear sword-shaped leaflets. Stipulas half-hastate, awl-shaped, entire. Stem unbranched, without wings.—Native of Siberia. The root is unknown. Stem simple. Leaflets remarkably narrow, slightly hairy. Stipulas of two awl-shaped long lobes, one erect, the other horizontal. *Flowers* racemose, yellow in the Linnæan wild specimen from Siberia, but Gmelin describes them as purple. His figure is carelessly drawn, and we suspect he may have confounded with this plant the narrow-leaved variety of *O. tuberosus*, as many others have done.

8. *O. sessilifolius*. Oriental Sessile-leaved Bitter-vetch. Sm. Prodr. Fl. Græc. Sibth. v. 2. 64. Fl. Græc. t. 692, unpublished. (*O. orientalis*, foliis angustissimis, costæ brevissimæ innascentibus; Tourn. Cor. 26.)—Leaves in pairs, sword-shaped, nearly sessile. Stipulas awl-shaped. Stems numerous, unbranched.—Gathered by Dr. Sibthorp about Athens and Messena. Root perennial, tapering, branched.

Stems many, weak, unbranched, angular, without wings. *Leaves* of only one pair of narrow, dark-green, nearly sessile leaflets. Stipulas very narrow, entire, half-arrow-shaped. *Flowers* dark-purple, about four in each cluster.

9. *O. canescens*. Grey French Bitter-vetch. Linn. Suppl. 327. Willd. n. 8. (*Arachi vel apios leguminosæ species*, Tossano Carolo; Bauh. Hist. v. 2. 326 cap. 21.)—Stem branched. Leaves pinnate, with two pair of linear-lanceolate leaflets. Stipulas half-arrow-shaped, awl-shaped.—Native of Burgundy. Bauhin. We know this merely from the authors cited, not having seen any specimen. It is said to differ from *O. angustifolius*, in having a branched stem, and whitish-blue *flowers*. The figure and description of Bauhin answer very nearly to the narrow-leaved variety of the *tuberosus*.

10. *O. varius*. Parti-coloured Bitter-vetch. Soland. MSS. Curt. Mag. t. 675. (*O. angustifolius italicus*, flore vario; Tourn. Inst. 393. *Astragalus quibusdam, aracho Tossani Caroli similis*; Bauh. Hist. v. 2. 326. cap. 22.)—Leaves pinnate, with about four pair of linear-lanceolate leaflets. Stipulas half-arrow-shaped, entire. Stem winged, branched above.—Native of Italy, near Bologna. A hardy perennial with us, easily propagated by off-sets from the roots, and flowering abundantly in May or June, when its parti-coloured and very elegant blossoms are a great ornament to the parterre. Linnæus seems to have confounded this in his herbarium with *angustifolius*, from which it totally differs in its winged and branched stem, much broader and more numerous leaflets, and broader stipulas. The *flowers* are about six in each cluster; their calyx red; standard crimson, fading to a pale yellow; wings and keel variegated with yellow and buff. Curtis says it rarely produces seed in England.

11. *O. atropurpureus*. Dark-purple Bitter-vetch. Defont. Atlant. v. 2. 157. t. 196. Willd. n. 9.—Leaves pinnate, with about three pair of linear leaflets. Stipulas half-hastate, somewhat toothed. Stem roundish, striated. Flowers tubular.—Gathered by Desfontaines in neglected fields at Algiers. We have a Sicilian specimen from Mr. Bivona Bernardi, which that excellent botanist was inclined to think a distinct species, because the stems are more angular than Desfontaines represents. The root is perennial, rather woody. Stems twelve or eighteen inches high, roundish, but with some appearance of angles, striated, either simple or branched. Leaves of two or three pair of linear, very narrow leaflets, on a common stalk an inch long. *Flowers* from four to twelve or more, in a dense cluster, turned one way, on a long stalk. Corolla about an inch in length, the pale claws of its petals remarkably long, cohering in a tubular manner, their limb deep purple or violet.

12. *O. niger*. Black Bitter-vetch. Linn. Sp. Pl. 1028. Willd. n. 10. (*O. sylvaticus, vicæ foliis*; Riv. Tetrap. Irr. t. 60. *Astragaloides*; Ger. em. 1239.)—Stem branched. Leaves pinnate, with about six pair of ovate-oblong smooth leaflets.—Native of various parts of Europe, from Sweden to Greece, but not of Britain. We have long had it in curious gardens, flowering about June. The stem is erect, branched, two or three feet high, angular. Leaves copious, of about six pair of ovate, bluntnish, awned, smooth leaflets, paler beneath, an inch long, on a common stalk tipped with a bristle. Clusters shortish, of from four to six dull purple *flowers*, their common stalk longer than the leaves. The whole plant turns black in drying.

13. *O. pyrenaicus*. Pyrenæan Bitter-vetch. Linn. Sp. Pl. 1029. Scop. Carn. v. 2. 59. *O. pyrenaicus latifolius nervosus*; Pluk. Phyt. t. 210. f. 2.)—Stem branched. Leaves pinnate, with two pair of elliptical ribbed leaflets. Stipulas

Stipulas somewhat spinous.—Native of the Pyrenées, and of Carniola. We have seen no specimen. The root is marked as perennial. The stem is said by Scopoli to be angular, and in some degree winged. Leaflets ovate-oblong, with slightly hairy ribs beneath. Flowers racemose, pendulous. Standard red, marked with darker lines. Legume slightly downy.

14. *O. sylvaticus*. Tufted Wood Bitter-vetch. Linn. Sp. Pl. 1029. Sm. Fl. Brit. n. 2. Engl. Bot. t. 518. Lightf. Scot. 390. t. 16. (*Vicia castubica*; Fl. Dan. t. 98, but not of Linnæus.)—Stems branched, decumbent, hairy. Leaves pinnate, with numerous ovato-lanceolate, hairy leaflets. Stipulas half-arrowshaped. Legume ovate, with about three seeds.—Native of the northern parts of Britain, as well as of Denmark and France, flowering in May or June. The root is strong and perennial. Stems numerous, angular, prostrate, branched after flowering. The very numerous and small, hairy, ovate leaflets distinguish this species from all the foregoing. The flowers also are many in each cluster, pale buff, veined with purple. But perhaps the most essential character consists in the shortness and breadth of the legume, in which respect, as well as habit, this plant accords better with many *Vicia* than with the present genus.

A truly wonderful variety of *O. sylvaticus* was found by the late Mr. Todd, on hills near Hafod, Cardiganshire, the admired seat of T. Johnes, esq. M.P. In this the leaves are simple and solitary, from five to ten times the size of the usual leaflets, and more obtuse. Though this variety has been much cultivated, it has never yet been known to produce flowers.

15. *O. ochroleucus*. Buff Bitter-vetch. Willd. n. 13. Waldstein and Kitaibel Pl. Rar. Hungar.—Stem branched, erect, hairy. Leaves pinnate, with numerous, smooth, elliptical leaflets. Stipulas ovato-lanceolate.—Native of Hungary. We have seen no specimen nor figure. Willdenow says it is like the last, but abundantly distinguished by its erect, less hairy stem, smooth leaflets, and ovato-lanceolate stipulas. The corolla is pale sulphur-coloured, or buff.

Professor Martyn describes four more species, which Miller received from Houston; but they have not been admitted by any other writer, nor dare we adopt them without seeing specimens in order to ascertain their genus.

OROBUS, in Gardening, contains plants of the hardy, herbaceous, fibrous-rooted, perennial flowery kind, of which the species cultivated are: the upright bitter-vetch (*O. lathyroides*); the yellow bitter-vetch (*O. luteus*); the spring bitter-vetch (*O. vernus*); the tuberous bitter-vetch (*O. tuberosus*); the black bitter-vetch (*O. niger*); and the Pyrenean bitter-vetch (*O. pyrenaicus*).

Of the third there are varieties with purple flowers, with pale blue flowers, with deep blue flowers.

The fourth sort is sometimes called wood-pea and heath-pea.

Method of Culture.—All the sorts are capable of being increased by seeds and parting the roots. The seed should be sown in the beginning of the autumn, as in September or October, in the clumps, borders, or other parts where they are to remain, or on a bed of good earth, to be afterwards pricked out and transplanted. The plants should be kept perfectly free from weeds.

The roots of the large plants may be parted in the autumn, and immediately planted out where the plants are to grow. The small roots may be set in nursery rows, to remain till sufficiently strong for being finally planted out.

They are all hardy flowering ornamental plants for the borders, clumps, and other parts of pleasure grounds.

OROCONITES, in the *Materia Medica*, a name given by Hippocrates, and others, to a bulbous root that is recommended as a rich food. It has the name from the Greek *oros*, a mountain, and *konites*, of a conic figure. This shews that it was a root of such a shape, found growing in mountainous places; but the learned have been puzzled in their attempts to find out what it was.

ORODADA, in Geography, a town of Peru, on the coast; six miles S.W. of Payta.

OROE, an island of Denmark, at the S. end of the Little Belt, about twelve miles long, and two wide; eight miles S.W. of the island of Funen. N. lat. 54° 59'. E. long. 10° 20'.

OROSKIOBING, a sea-port of Denmark, situated on the E. side of the island of Oroe. N. lat. 54° 58'. E. long. 10° 23'.

OROMASDES, in Mythology. See OROMADES.

OROMOECTO, in Geography, a river of New Brunswick, which runs into St. John's river, N. lat. 45° 48'. W. long. 66° 40', and by which the Indians have a communication with Passamaquoddy bay.

OROMTCHI, a town of Thibet; 48 miles E. of Manas-Hotun. N. lat. 44° 58'. E. long. 86° 44'.

ORON, or *Oron la Ville*, a town of Switzerland, in the canton of Berne; six miles N. of Vevey.

ORONDOCKS, an Indian tribe who live near Trois Rivières, and who could furnish, between 30 and 40 years ago, 100 warriors.

ORONHI, a town of Thibet, 38 miles W. of Yolotou-Hotun.

ORONO'S ISLAND, a small island in the river Penobscot.

ORONSAY, one of the western islands of Scotland, which is a small island only at high water, on the N. coast of North Uist, of which it makes a part at low water. N. lat. 57° 30'. W. long. 7° 16'.

ORONTES, or AXIUS, a river of Syria, which sprung towards N. lat. 33° 30', between Libanus and Antilibanus, and ran into the Mediterranean, about six leagues below Antioch. It watered, in its course towards the north, Emesa, Epiphania, Apamea, Antioch, and several other towns. This river was formerly the most considerable in Syria; but Volney represents it as a rivulet rather than a river. The channel of the Orontes, as well as that of the Jordan, says this traveller, are scarcely 60 paces wide at their mouths, and if the Orontes were not impeded by successive obstacles, it would be quite dry during the summer. It derives its importance in winter from rains and melted snows, but during the remainder of the year, its course would hardly be discovered if it were not marked by the round stones and fragments of rocks with which its bed is filled. This river, and also the other streams of Syria, are nothing but torrents and cascades; and it may be conceived, from the proximity of the mountains, among which they rise, to the sea, that their waters have not time to collect in long valleys, so as to form rivers. If the mouth of the Orontes were cleared, boats might be towed up this river, though they could not sail up, on account of the rapidity of its stream; and thus Antioch would better serve as an emporium to the Europeans than Aleppo. The natives, who never knew the name Orontes, call it, on account of the swiftness of its stream, "El-Ausi," rendered by the Greeks "Axius," that is, the rebel. At Antioch its breadth is about 40 paces. Seven leagues above that town it passes by a lake abounding with fish, and especially eels; great quantities of which are salted every year, though not sufficient for the numerous fasts of the Greek Christians.

ORONTES,

ORONTES, a mountain of Asia, in Media, near Ecbatana. Ptolemy.

ORONTIUM, in Botany, *οροντιον* of the Greeks, a name whose etymology is lost in the darkness of antiquity. It is said to have belonged to an herb used in baths, or fomentations, for the jaundice, and some have suspected it to be a corruption of *Origanum*. Professor Martyn suggests that the word may have come from *οραω*, to see; which is founded on the supposition of the plant's being useful to the eye-sight. The same name has been given to a species of *Antirrhinum*; but this seems to have originated in the Dutch appellation of the last-mentioned genus, *orant*, easily assimilated to *Orontium*. Linnæus appears to have laid hold of it, as an unoccupied name, for the present genus, which Mitchell had called *Aronia*, from its partial resemblance probably to *Arum*. Whether the similarity of found led Linnæus to this application, we will not presume to determine. Linn. Gen. 172. Schreb. 229. Willd. Sp. Pl. v. 2. 199. Mart. Mill. Dict. v. 3. Ait. Hort. Kew. ed. 2. v. 2. 306. Juss. 25. Lamarek Illustr. t. 251.—Class and order, *Hexandria Monogynia*. Nat. Ord. *Piperita*, Linn. *Aroidea*, Juss.

Gen. Ch. reformed. Cal. none, except the *bractæes* be taken for *spathas*. Cor. in six deep, concave, obtuse, angular segments, inflexed at the points, the three alternate ones rather the smallest, permanent. Stam. Filaments six, inserted into the segments of the corolla, flat, linear, equal, shorter than the corolla; anthers roundish, of two lobes, bursting at the top. Pist. Germen superior, large, roundish, depressed; style none; stigma roundish, cloven. Peric. Drupa roundish. Seed. Nut large, solitary, of a bony substance.

Eff. Ch. Corolla inferior, in six deep inflexed segments. Stamens flat, inserted into the corolla. Style none. Drupa with one bony seed.

Obs. We have endeavoured to correct the generic character, from a comparison of both the known species. Dr. Buchanan met with a plant in Nepal, there called *Tilcussa*, whose habit is precisely that of *O. japonicum*, but the *bractæes* are very long, and the fruit a berry of three cells, with six seeds when in perfection, though indeed some of both are mostly abortive.

1. *O. aquaticum*. Aquatic Orontium. Linn. Sp. Pl. 463. Amœn. Acad. v. 3. 17. t. 1. f. 3. Willd. n. 1. Ait. n. 1.—Leaves floating, stalked.—Native of rivers and pools in North America. Cultivated in cisterns at Kew, where it flowers in June and July. The root is perennial, descending deep into the mud. Herb smooth, like a *Potamogeton* in its mode of growth. Leaves floating, elliptic-lanceolate, acute, entire, a span long, with numerous parallel ribs. Spikes solitary, on long simple stalks, whitish under the spike, which is about an inch long, cylindrical, very dense, of numerous, crowded, sessile, greenish-white flowers, with a short concave membranous bractea under each flower. The germen soon becomes very large, depressed, dark green, with a large white horny seed, which we have seen in a half-ripe state only, so that we are not acquainted with the appearance or texture of the pericarp at an advanced period.

2. *O. japonicum*. Japan Orontium. Thunb. Japon. 144. Willd. n. 2. Ait. n. 2. Curt. Mag. t. 898. Banks Ic. Kœmpf. t. 12. (Kirò et Rirjo, vulgò Omotto; Kœmpf. Am. Exot. 785.)—Leaves erect, dilated and sheathing at the base.—Native of Japan, growing in waste ground, and allowed to occupy such corners in gardens as would otherwise be bare. It is a hardy perennial at Kew, flowering very early in the spring. The root is thick and long, with numerous strong simple fibres. Stem none. Leaves numerous, erect, coriaceous, smooth, ribbed, convoluted,

about a foot high, with a dilated sheathing base. Spikes solitary, on short, simple, round, upright, radical stalks, each spike about an inch and half long, cylindrical, obtuse, very dense, of numerous, crowded, greenish-yellow flowers, the inflexed broad summits of whose crowded petals give the whole a tessellated aspect. Kœmpfer describes the fruit the size and shape of a small olive, scarlet, nauseous, with a heart-shaped bony seed. The bractæes are short, rounded, and membranous, like those of the first species.

OROOLOG, in Geography, the name of one of the Pelew isles, on which Capt. Wilson was wrecked. See PELEW.

OROONOKO, ORINOKO, or *Orinoco*, a large river of South America, distinguished by its very singular and perplexed course. According to La Cruz it rises in the small lake of Ipava, N. lat. 5° 5', and thence winds almost in a spiral form; first passing to the S.E. it enters the lake of Parima, and issues by two outlets on the N. and S. of that lake towards the W., but after receiving the Guaviari, it bends N., then N.E., till it enters the Atlantic ocean by an extended delta opposite to the isle of Trinidad; but the chief estuary is considerably to the S.E. of that island. Many large rivers flow into the Oroonoko; and besides its singular form, it has other remarkable peculiarities. From the S.E. of the lake of Parima, which seems to be a kind of inundation formed by the Oroonoko, the White river, called also that of Parima, joins the Black river, and thence the great flood of the Marañon. Another stream, called the Siaba, flows from the S.W. of the lake into the Black river, and joins another stream, which directly connects the Marañon with the Oroonoko. There is also a communication between the Black river and the Marañon, by the Joa Parana; so that there are three communications between these three great rivers. In the year 1800, the Prussian traveller, Humboldt, resolved to explore the reported fact of the junction of the Oroonoko with the Marañon, by the great river Negro. He entered the Orinoco by the river Apuri, and after encountering many difficulties reached the fort of San Carlos, towards the Portuguese frontier. From this fort he returned to the Orinoco by the river Casiquari, a very strong branch of the Orinoco, which communicates with the river Negro. This navigation was rendered fatiguing and dangerous by the force of the current, the prodigious number of mosquitoes and ants, and the want of population, 300 leagues having been travelled by him without seeing a human countenance. He entered the Orinoco by the Casiquari at 3° 30', and remounted the current of the Orinoco to Esmeralda, the last Spanish settlement in that quarter. This remarkable communication had been marked in his map by Samson de Fer, geographer to his Catholic majesty in 1713, and confirmed by the able Condamine.

The mouths of the Orinoco are of perilous navigation, and require an expert pilot. Seven of them are navigable for large vessels; but the chief is the great mouth, about six leagues wide, being the most southern, and in the direct course of the river. The isles of the Orinoco, or rather its Delta, which is of prodigious extent, are possessed by the Guaranos and the Mariufas, two independent tribes of Indians. The river Caroni, running from the S. to the N. for nearly 100 leagues, is celebrated in the expedition of Raleigh. It preserves its clearness for half a league after it joins the Orinoco, having mostly run over a fine black sand.

The beauty and grandeur of the banks of the Orinoco surpass all description. Forests of the most superb verdure are crowded with birds and monkeys of the most various and brilliant

brilliant colours; and sometimes immense plains form an horizon of 20 or 30 leagues. The annual inundation of the Orinoco begins in April and ends in August, and in the northern part sometimes extends for 20 or 30 leagues, during a length of 200. This grand extent it will retain for the whole month of September. The usual swell at San Tomé, or Old Guiana, founded in 1586, on the southern bank of the Orinoco, 50 leagues from its mouth, but transferred in 1764 to a more safe position about 90 leagues from the sea, is of 13 fathoms. In October the flood declines; and the river is lowest in February. The Cayman, which is strictly neither an alligator nor a crocodile, is a terrible inhabitant of the Orinoco.

During the great floods, the river Orinoco, where it passes a range of mountains at a place called Angostura or the strait, rises not less than 40 varas or Spanish yards. Of the savages on the Orinoco, Gumilla published, in 1745, an interesting account. The nation of the Caberres exceeds the Caribs in courage and power. They are famous for the use of a mortal poison, and in his time were situated on the Guaviari. The Otomacs, in the same quarter, raise their dead after the expiration of 12 months, and transport the bones to a general tomb. Their women asserted that to cover their nakedness inspired them with shame, as it led to ideas of turpitude unknown before. The Otomacs are accustomed to eat earth, as Humboldt has recently observed. But, in fact, they only preserve their grain, fish, turtle, &c. in earth, and eat the whole mingled, so that a stranger would imagine that they devoured earth. This is done with a view to keep their victuals fresh; and the pieces afterwards dug from the pits resemble bricks. Some of them are said to eat $1\frac{1}{2}$ lb. of this earth *per* day. On the Orinoco most of the dialects are derived from the Betoya or Jirara, and the Cariba. Most of the tribes are small, from 500 to 2000 warriors; but the Caribs boast of 12,000, and the Caberres were more numerous. The fury of the Caribs is not more destructive than domestic poison. Many mothers destroy their female children, to deliver them from the miseries suffered by women in a savage state; and they even regard this practice as an office of tender affection. If we except the Otomacs, the Caberres, and the Caribs, the other tribes mostly flee when one or two fall in battle. All are deceitful and addicted to falsehood. In general, these savages bathe twice a day, thus observing a practice that conduces both to health and pleasure. The mouth, or main channel of the Orinoco, is laid down in N. lat. $8^{\circ} 30'$. W. long. $59^{\circ} 50'$. Pinkerton's *Geography*, vol. iii.

OROONOKO, *Little*. See MOCOMOCO.

OROPESA, the capital of the jurisdiction of Cochabamba, in South America, situated on a small river in a valley. The inhabitants trade with their corn and fruits, which are produced in considerable quantities in the valley, where their town is situated; 150 miles N.W. of La Plata. S. lat. $18^{\circ} 15'$. W. long. $67^{\circ} 6'$.—Alfo, a town of Spain, in New Castile; 52 miles W. of Toledo.—Alfo, a town of Spain, in Valencia, on the coast of the Mediterranean; 32 miles E.N.E. of Segorbe. N. lat. $40^{\circ} 8'$. W. long. $0^{\circ} 4'$.

OROPESA, *Cape*, a cape of Spain, on the coast of Valencia. N. lat. $40^{\circ} 7'$. E. long. $0^{\circ} 1'$.

OROPUS, in *Ancient Geography*, a town of Asia, in Syria, said to have been built by Nicator. Steph. Byz.—Alfo, a town of Macedonia.—Alfo, a town of Attica, near the sea-coast. The inhabitants of this town were the first who reckoned Amphiarus in the number of the gods, and the other Greeks followed their example. At 12 stadia from the town was a temple of this deity. Amphiarus excelled

in the interpretation of dreams, and he delivered his predictions in hexameter verses.—Alfo, a town of Greece, in the island of Eubœa, in which was a temple consecrated to Apollo.—Alfo, a town of the Peloponnesus, in the Argolide.—Alfo, a town of Greece, in Thesprotia, of which town Nicopolis was probably a part.

OROSEI, in *Geography*, a town of Sardinia, on the E. coast; 58 miles E. of Alghieri.

OROSIUS, PAUL, in *Biography*, a priest of Tarragona, in Catalonia, flourished in the beginning of the fifth century. He was in early life a disciple of St. Augustin. In the year 414 he was sent by two Spanish bishops into Africa, to request aid from St. Augustin against the heretics who disturbed their churches. He remained a year with that prelate, and under his guidance made a great progress in the study of the scriptures. In 415 Orosius was sent by him on a mission to St. Jerome at Jerusalem, and brought from thence into Africa a number of relics. It was at the desire of St. Augustin that he undertook to write a history from the creation to the year 416, the object of which was to refute the calumnies of the Pagans against Christianity. He accordingly compiled, in seven books, a view of general history, which he is said to have entitled “De Miseria Huminum.” His ignorance of the Greek language involved him in many mistakes. Orosius was author likewise of “A Defence of the Freedom of the Will,” against the Pelagians, and other works. The “History” has gone through several editions, of which the best is, unquestionably, that of Havercamp, 1738. A translation of it by our immortal Alfred is still extant, in which it has the title “Hormesta,” but the reason for this change in the title has not been ascertained. Bayle. Moreri.

OROSMADES, OROMASDES, or Oromazes, in *Mythology*, a deity among the Persians, which is deemed the principle, or author of good, in the system of Zoroaster, revived by the Manichees. OrosmaDES produced the good spirits and the stars, and enclosed them in an egg, which was broken by Arimanius; whence proceeded confusion, and a mixture of good and evil. But after many conflicts the good deity totally vanquishes the evil one. See ARIMANIUS.

OROSPEDA, or ORTOSPEDA, in *Ancient Geography*, a mountain of Spain, in which were the springs of the river Bœtis, according to Strabo, who adds, that it was inhabited by the Oretani. This mountain is situated in the province of Grenada, on the borders of Seville.

OROSPIZA, in *Ornithology*, a name by which the ancient naturalists call the brambling, or mountain-finch.

The word is Greek, and expresses *mountain-chaffinch*. See MONTIFRINGILLA.

OROSWEG, in *Geography*, a town of Hungary, the see of a bishop; 8 miles N. of Munkacz.

OROVITZA, a town of Slavonia; 14 miles N.N.E. of Polzega.

OROUST, an island in the North sea, near the W. coast of Sweden, 40 miles in circumference. N. lat. $58^{\circ} 10'$. E. long. $11^{\circ} 30'$.

ORPELLO, a preparation of brass used in the glass trade, and prepared in this manner: cut plates of brass into small pieces, and place them in a luted crucible in a strong fire, but not so violent as to melt it. Let it stand in this manner for four days, in which time it will be well calcined; when cold, powder and sift it, and finally grind it on a porphyry. This will be a black powder; spread this on tiles, which place on burning coals in the leer, near the hole, for four days; take off the ashes that may fall into it, and finally powder and sift it fine for use. It is known to be

nically prepared, when, on mixing with the melted metal in the glass furnace, it makes it swell and boil.

The colour it gives is a very elegant sky-colour, and a sea-green, or a mixt colour, between them, according to the quantity and degree of calcination. Neri's Art of Glass, p. 35.

ORPHAN, a child, or minor, destitute of father; or that has neither father nor mother.

Hence the Taborites, or followers of Zisca, finding themselves, at his death, without chief or conductor, took the appellation of *orphans*.

Among the Athenians, the orphans whose fathers had lost their lives in the service of their country, were under the guardianship of the polemarchus, who was to provide them with a competent maintenance out of the public treasury.

In the city of London there is a court of record established for the care and government of orphans. The lord-mayor and aldermen of London have the custody of orphans under age, and unmarried, of freemen that die; and the keeping of all their lands and goods; and if they commit the custody of an orphan to any man, he shall have a writ of *ravishment of ward*, if the orphan be taken away; or the mayor and aldermen may imprison the offender, until he produces the infant. If any one, without the consent of the court of aldermen, marries such an orphan under the age of twenty-one years, though out of the city, they may fine and imprison him until paid.

Executors and administrators of freemen dying, are to exhibit true inventories of their estates before the lord-mayor and aldermen in the court of orphans, and give security to the chamberlain of London and his successors, by recognizance, for the orphan's part; which if they refuse to do, they may be committed to prison until they obey.

The lord-mayor and commonalty of London being answerable for the orphans' money paid into the chamber of the city, and by some accidents become indebted to the orphans and their creditors, in a greater sum than they could pay; it was enacted by 5 & 6 W. and M. cap. 10. that the lands, markets, fairs, &c. belonging to the city of London, shall be chargeable for raising 8000*l.* to be appropriated for a perpetual fund for orphans; and towards raising such a fund, the mayor and commonalty may assess 2000*l.* yearly upon the personal estates of the inhabitants of the city, and levy the same by distress. A duty is also granted of 4*s.* per ton on wines imported, and on coals, and every apprentice shall pay 2*s.* 6*d.* when he is bound, and 5*s.* when he is admitted a freeman, for raising the fund, which is to be applied for payment of the debts due to orphans, by interest, after the rate of 4 per cent.

By the custom of London, the share of the children, or orphanage part, is not fully vested in them till the age of twenty-one, before which they cannot dispose of it by testament, and if they die under that age, whether sole or married, their shares shall survive to the other children; but after the age of twenty-one, it is free from any orphanage custom, and, in case of intestacy, shall fall under the statute of distributions. See *CUSTOM of London*.

ORPHAN *Island*, in *Geography*, an island of America, at the mouth of the Penobscot, containing about 10,000 acres of excellent tillage land.

ORPHAN'S *Bank*, a fishing-bank off the S.E. point of Chaleur's bay, on the N.E. coast of New Brunswick, on which is from 75 to 30 fathoms water.

ORPHAN'S *Island*, an island in lake Ontario, lying off the E. shore of Marysburg, and near to it, in Traversé bay.

ORPHANUS, in *Natural History*, a name given by some authors to a poor species of opal, called by some *pseudo-opalus*; it has no other colours beside a milky-white, and purplish-red. This stone is frequent in Germany, and Hungary.

ORPHEON, a stringed instrument, turned with a wheel like the vielle, which it very much resembles.

ORPHEORON, a stringed instrument of music, smaller than the pandora, but which it entirely resembles. It is tuned like the lute: its highest or first string is G.

ORPHEOTELISTÆ, *Ορφεοτελισται*, in *Antiquity*, persons initiated in the Orphic mysteries. They assured all that were admitted into their society of certain felicity after death. (See ORPHEUS.) At their initiation, little else was required of them besides an oath of secrecy.

ORPHEUS, in *Grecian History*, and *Mythology*, is one of the most ancient and venerable names among the poets and musicians of Greece. His reputation was established as early as the time of the Argonautic expedition, in which he was himself an adventurer: and is said by Apollonius Rhodius, not only to have incited the Argonauts to row by the sound of his lyre, but to have vanquished and put to silence the Sirens, by the superiority of his strains. Yet, notwithstanding the great celebrity he had so long enjoyed, there is a passage in Cicero, which says, that Aristotle, in the third book of his Poetics, which is now lost, was of opinion that such a person as Orpheus never existed; but as the work of Cicero, in which this passage occurs, is in dialogue, it is not easy to discover what was his own opinion upon the subject, the words cited being put into the mouth of Caius Cotta. And Cicero, in other parts of his writings, mentions Orpheus as a person of whose existence he had no doubts. There are several ancient authors, among whom is Suidas, who enumerate five persons of the name of Orpheus, and relate some particulars of each. And it is very probable that it has fared with Orpheus as with Hercules, and that writers have attributed to one the actions of many. But however that may have been, we shall not attempt to collect all the fables that poets and mythologists have invented concerning him. They are too well known to need insertion here. We shall, therefore, in speaking of him, make use only of such materials as the best ancient historians, and the most respectable writers among the moderns, have furnished towards his history.

Dr. Cudworth, in his "Intellectual System," after examining and confuting the objections that have been made to the being of an Orpheus, and, with his usual learning and abilities, clearly establishing his existence, proceeds, in a very ample manner, to speak of the opinions and writings of our bard, whom he regards not only as the first musician and poet of antiquity, but as a great mythologist, from whom the Greeks derive the Thracian religious rites and mysteries.

"It is the opinion," says he, "of some eminent philologists of later times, that there never was any such person as Orpheus, except in Fairy-land; and that his whole history was nothing but a mere romantic allegory, utterly devoid of truth and reality. But there is nothing alleged for this opinion from antiquity, except the one passage of Cicero concerning Aristotle, who seems to have meant no more than this, that there was no such poet as Orpheus anterior to Homer, or that the verses vulgarly called Orphical were not written by Orpheus. However, if it should be granted that Aristotle had denied the existence of such a man, there

seems to be no reason why his single testimony should preponderate against the universal consent of all antiquity, which agrees, that Orpheus was the son of Oeager, by birth a Thracian, the father, or chief founder of the mythological and allegorical theology amongst the Greeks, and of all their most sacred religious rites and mysteries; who is commonly supposed to have lived before the Trojan war, that is, in the time of the Israelitish judges, or at least to have been senior both to Hesiod and Homer, and to have died a violent death, most affirming that he was torn in pieces by women. For which reason, in the vision of Herus Pamphilius, in Plato, Orpheus's soul, passing into another body, is said to have chosen that of a swan, a reputed musical animal, on account of the great hatred he had conceived for all women, from the death which they had inflicted on him. And the historic truth of Orpheus was not only acknowledged by Plato, but also by Isocrates, who lived before Aristotle, in his oration in praise of Busiris; and confirmed by the grave historian, Diodorus Siculus, who says, that Orpheus diligently applied himself to literature, and when he had learned *τα μυθολογούμενα*, or the mythological part of theology, he travelled into Egypt, where he soon became the greatest proficient among the Greeks, in the mysteries of religion, theology, and poetry. Neither was this history of Orpheus contradicted by Origen, when so justly provoked by Celsus, who had preferred him to our Saviour; and, according to Suidas, Orpheus the Thracian was the first inventor of the religious mysteries of the Greeks, and that religion was thence called Threskeia, as it was a Thracian invention. On account of the great antiquity of Orpheus, there have been numberless fables intermingled with his history, yet there appears no reason that we should disbelieve the existence of such a man."

The bishop of Gloucester speaks no more doubtfully of the existence of Orpheus, than of Homer and Hesiod, with whom he ranks him, not only as poet, but also as a theologian, and founder of religion. This learned author has thrown new lights upon the character of Orpheus; our pursuits are somewhat different; it was his business to introduce him to his readers as a philosopher, a legislator, and a mystagogue; and it is ours, after establishing his existence, to rank him among the first cultivators of music and poetry, and to give him that exalted and respectable station among illustrious bards, which has been allowed him by almost all antiquity.

The family of Orpheus is traced by sir Isaac Newton for several generations: "Sesac passing over the Hellespont, conquers Thrace, kills Lycurgus, king of that country, and gives his kingdom, and one of his singing women, to Oeagrus, the son of Tharops, and father of Orpheus; hence Orpheus is said to have had the muse Calliope for his mother."

He is allowed by most ancient authors to have excelled in poetry and music, particularly the latter, and to have early cultivated the lyre, in preference to every other instrument; so that all those who came after him were contented to be his imitators; whereas he adopted no model, says Plutarch; for before his time no other music was known, except a few airs for the flute. Music was so closely connected in ancient times with the most sublime sciences, that Orpheus united it not only with philosophy, but with theology. He abstained from eating animal food, and held eggs in abhorrence as aliment, being persuaded that the egg subsisted before the chicken, and was the principle of all existence: both his knowledge and prejudices, it is probable, were acquired in Egypt, as well as those of Pythagoras, many ages after.

The passage in which Aristotle is said to have denied the

existence of Orpheus is lost, and it now rests on Cicero's quotation, who afterwards, in other works, restores him to life. With respect to his abstaining from the flesh of oxen, Gesner supposes it to have proceeded from the veneration shewn to that animal, so useful in tillage, in the Eleusinian mysteries, instituted in honour of Ceres, the goddess of agriculture. And with respect to theology, Diodorus Siculus tells us that his father Oeagrus gave him his first instructions in religion, imparting to him the mysteries of Bacchus, as they were then practised in Thrace. He became afterwards a disciple of the Idæi Daëtyli, in Crete, and there acquired new ideas concerning religious ceremonies. But nothing contributed so much to his skill in theological matters as his journey into Egypt, where, being initiated into the mysteries of Isis and Osiris, or of Ceres and Bacchus, he acquired a knowledge concerning initiations, expiations, funeral rites, and other points of religious worship, far superior to any one of his age or country. And being much connected with the descendants of Cadmus, the founder of Thebes in Bœotia, he resolved, in order to honour their origin, to transport into Greece the whole fable of Osiris, and apply it to the family of Cadmus. The credulous people easily received this tale, and were much flattered by the institution of the ceremonies in honour of Osiris. Thus Orpheus, who was held in great veneration at the Grecian Thebes, of which he was become a citizen, admirably adapted this fable, and rendered it respectable, not only by his beautiful verses, and manner of singing them, but by the reputation he had acquired of being profoundly skilled in all religious concerns.

At his return into Greece, according to Pausanias, he was held in the highest veneration by the people, as they imagined he had discovered the secret of expiating crimes, purifying criminals, curing diseases, and appeasing the angry gods. He formed and promulgated an idea of a hell, from the funeral ceremonies of Egyptians, which was received throughout all Greece. He instituted the mysteries and worship of Hecate among the Eginetes, and that of Ceres at Sparta.

Profane authors look upon Orpheus as the inventor of that species of magic, called *evocation of the manes*, or raising ghosts; and indeed the hymns which are attributed to him are mostly pieces of incantation and real conjuration. Upon the death of his wife Eurydice, he retired to a place in Thesprotia, called Aornos, where an ancient oracle gave answers to such as evoked the dead. He there fancied he saw his dear Eurydice, and at his departure flattered himself that she followed him; but upon looking behind him, and not seeing her, he was so afflicted, that he soon died of grief.

There were persons among the ancients who made public profession of conjuring up ghosts, and there were temples where the ceremony of conjuration was to be performed. Pausanias speaks of that which was in Thesprotia, where Orpheus went to call up the ghost of his wife Eurydice. It is this very journey, and the motive which put him upon it, that made it believed he went down into hell.

The poets have embellished this story, and given to the lyre of Orpheus, not only the power of silencing Cerberus, and of suspending the torments of Tartarus, but also of charming even the infernal deities themselves, whom he rendered so far propitious to his intreaties, as to restore to him Eurydice, upon condition that he would not look at her, till he had quitted their dominions; a blessing which he soon forfeited, by a too eager and fatal affection.

" All

" All dangers past, at length the lovely bride
In safety goes, with her melodious guide ;
Longing the common light again to share,
And draw the vital breath of upper air :
He first, and close behind him follow'd she,
For such was Proserpine's severe decree.
When strong desires the impatient youth invade,
By little caution, and much love betrayed :
A fault which easy pardon might receive,
Were lovers judges, or could hell forgive.
For near the confines of ethereal light,
And longing for the glimmering of a sight,
Th' unwary lover cast a look behind,
Forgetful of the law, nor master of his mind.
Straight all his hopes exhal'd in empty smoke ;
And his long toils were forfeit for a look."

Dryden's Virgil.

Tzetzes explains the fable of his drawing his wife Eurydice from hell by his great skill in medicine, with which he prolonged her life, or, in other words, snatched her from the grave. *Æsculapius* and other physicians have been said to raise from the dead those whom they had recovered from dangerous diseases.

The bishop of Gloucester, in his learned and admirable account of the Eleusinian mysteries, says, " While these mysteries were confined to Egypt, their native country, and while the Grecian lawgivers went thither to be initiated, as a kind of designation to their office, the ceremony would be naturally described in terms highly allegorical. This way of speaking was used by Orpheus, Bacchus, and others ; and continued even after the mysteries were introduced into Greece, as appears by the fables of Hercules, Castor, Pollux, and Theseus's descent into hell ; but the allegory was so circumstanced, as to discover the truth concealed under it. So Orpheus is said to get to hell by the power of his harp :

" *Thrēichius fretus citharâ, fidibusque canoris.*"

Virg. *Æn.* vi. ver. 119.

that is, in quality of lawgiver ; the harp being the known symbol of his laws, by which he humanized a rude and barbarous people. Had an old poem, under the name of Orpheus, entitled " A Descent into Hell," been now extant, it would perhaps have shewn us, that no more was meant than Orpheus's *initiation*."

Many ancient writers, in speaking of his death, relate, that the Thracian women, enraged at being abandoned by their husbands, who were disciples of Orpheus, concealed themselves in the woods, in order to satiate their vengeance ; and, notwithstanding they postponed the perpetration of their design some time through fear, at length, by drinking to a degree of intoxication, they so far fortified their courage as to put him to death. And Plutarch assures us, that the Thracians stigmatized their women, even in his time, for the barbarity of this action.

Our venerable bard is defended by the author of the " Divine Legation," from some insinuations to his disadvantage in *Diogenes Laertius*. " It is true," says he, " if uncertain report was to be believed, the mysteries were corrupted very early ; for Orpheus himself is said to have abused them. But this was an art the debauched mystæ of later times employed to varnish their enormities ; as the detested pederasts of after ages scandalized the blameless Socrates. Besides, the story is so ill laid, that it is detected by the surest records of antiquity : for in consequence of what

they fabled of Orpheus in the mysteries, they pretended he was torn in pieces by the women ; whereas it appeared from the inscription on his monument, at Dium in Macedonia, that he was struck dead by lightning, the envied death of the reputed favourites of the gods."

This monument, at Dium, consisting of a marble urn on a pillar, was still to be seen in the time of Pausanias. It is said, however, that his sepulchre was removed from Libethra, upon mount Olympus, where Orpheus was born, and was thence transferred to Dium by the Macedonians, after the ruin of Libethra, by a sudden inundation, which a dreadful storm had occasioned. This event is very minutely related by Pausanias.

Virgil bestows the first place in his Elysium upon the legislators, and those who brought mankind from a state of nature into society.

" Magnanimi herocēs, nati melioribus annis."

At the head of these is Orpheus, the most renowned of the European lawgivers ; but better known under the character of poet : for the first laws being written in measure, to allure men to learn them, and, when learnt, to retain them, the fable would have it, that by the force of harmony, Orpheus softened the savage inhabitants of Thrace :

" — Thrēichius longa cum veste sacerdos

Obloquitur numeris septem discrimina vocum :

Jamque eadem digitis, jam pectine pulsat eburno."

Æn. lib. vi. ver. 645.

The seven strings given by the poet in this passage to the lyre of Orpheus, is a circumstance somewhat historical. The first Mercurian lyre had, at most, but four strings. Others were afterwards added to it by the second Mercury, or by Amphion ; but, according to several traditions preserved by Greek historians, it was Orpheus who completed the second tetrachord, which extended the scale to a heptachord, or seven sounds, implied by the *septem discrimina vocum* : for the assertion of many writers, that Orpheus added two new strings to the lyre, which before had seven, clashes with the claims of Pythagoras to the invention of the octachord, or addition of an eighth sound to the heptachord, which made the scale consist of two disjunct, instead of two conjunct tetrachords, and of which almost all antiquity allows him to have been the inventor. Nor is it easy to suppose, that the lyre should have been represented in ancient sculpture with four or five strings only, if it had had nine so early as the time of Orpheus, who flourished long before sculpture was known in Greece.

Orpheus is mentioned by Pindar in his fourth Pythic. The passage is curious : " Orpheus," says he, " speaking of the Argonauts, joins these heroes ; Orpheus, father of the lyre and of song ; Orpheus, whom the whole universe celebrates, and whose fire is Apollo." Herodotus likewise speaks of the Orphic mysteries. His hymns, says Pausanias, were very short, and but few in number ; the Lycornides, an Athenian family, knew them by heart, and had an exclusive privilege of singing them, and those of their old poets, Musæus, Onomacritus, Pamphus, and Olen, at the celebration of the Eleusinian mysteries ; that is, the priesthood was hereditary in this family.

Iamblicus tells us, that the poems under the name of Orpheus were written in the Doric dialect, but have since been trans-dialected, or modernised. It was the common opinion in antiquity that they were genuine ; but even those who doubted of it, gave them to the earliest Pythagoreans, and some of them to Pythagoras himself, who has frequently been

been called the follower of Orpheus, and been supposed to have adopted many of his opinions.

If we have selected with too much sedulity and minuteness whatever ancient and modern writers relative to Orpheus have said, it has been occasioned by an involuntary zeal for the fame of this musical and poetical patriarch; which, warm at first, grew more and more heated in the course of enquiry; and stimulated by the respect and veneration which we found paid to him by antiquity, we became a kind of convert to the mythology, and eagerly aspired at initiation into his mysteries, in order to reveal them to our reader.

The true doctrine of Orpheus on the subject of Cosmogony is said to be contained in an epitome made long ago by Timotheus, the chronographer. This writer says, that Orpheus gave an account of the generation of the gods, the creation of the world, and the formation of man, professing, that he delivered nothing from his own invention, but as he was informed, on inquiry, by Phœbus, Titan, or the Sun. His account is briefly as follows: that in the beginning the ether, or heaven, was formed by God; and that on each side of the ether were chaos and dark night, which covered whatsoever was under the ether, thereby signifying, that night was prior. He declared also, that there was a certain incomprehensible being, which was the highest and most ancient of all things, and the maker of the universe, both of the ether itself, and of things under the ether; that the earth was invisible by reason of the darkness which was upon it; but the light, breaking forth through the ether, illuminated the whole creation; this light, which so broke forth, being said by him to be that highest of all beings before-mentioned, whose name, as revealed by the oracle, was Counsel, Light, and the Giver of Life: that these three names manifest one and the same power and might of that invisible and incomprehensible God, who is the maker of all things, and who bringeth that which is not, into a state of existence; by which power were procured all incorporeal principles, and the sun, the moon, the stars, the earth, and the sea, and all things therein, both visible and invisible. He likewise declared, that mankind was formed out of the earth by the same Deity, and received from him a rational soul, agreeably to what Moses has recorded. Timotheus adds, that the same Orpheus also wrote, that all things were made by one godhead of three names, and that this God is all things. (Timoth. Chronogr. apud Euseb. Chron. Græc. Vide etiam Suidam, in voce Orpheus; and Procl. in Tim. lib. ii.) If this testimony be admitted, we need not appeal to the Orphic verses, which are very full as to the assertion of a Supreme Deity. Many of these verses, it is true, are supposititious, and manifestly forged either by Christians or Jews; but the same cannot be said of them all: several being cited by Pagan authors, as having been written, if not by Orpheus himself, yet by persons of great antiquity, and well acquainted with his doctrine and traditions, and, therefore, thought, by men of good learning and judgment, genuine, and worthy of some regard. (Cudworth Intel. Syst.) However, Orpheus's theology has been preferred to that of the other heathens by the Christian fathers; and an ingenious writer (Burnet, Archæolog. lib. i.) has surmised, that his establishing of polytheism was owing rather to the necessity he was under of complying with the stupidity of the barbarous people, whom he first civilized, than his own approbation; being obliged to give them, not the religion which he himself best approved, but such a one as they were capable of receiving. It is further observable with regard to the doctrine of this ancient poet, that he was the first who taught the Greeks the doctrine of the primitive egg, whence

all other beings proceeded (Plut. in Symp. Macrob. Sat. l. vii. c. 16.); an opinion very ancient, which, without doubt, he had learned from the Egyptians, who, as well as those of several other nations, represented the world under this emblem. This symbol was adopted and employed by the Phœnicians, Chaldeans, Persians, Indians, and even the Chinese; nor is it improbable, that this was the primary opinion of all who undertook to explain the formation of the world.

Brucker, in his "History of Philosophy by Enfield," (vol. i.) has deduced from the Orphic verses and other fragments of Orpheus the following summary of the doctrine of Orpheus concerning God and nature. "God, from all eternity, contained within himself the unformed principles of the material world, and consisted of a compound nature, active and passive. By the energy of the active principle, he sent forth from himself, at the commencement of a certain finite period, all material and spiritual beings, which partake, in different degrees, of the divine nature. All beings, proceeding originally from God, will, after certain purgations, return to him. The universe itself will be destroyed by fire, and afterwards renewed." He adds, an Orphic fragment is preserved by Athenagoras, in which the formation of the world is represented under the emblem of an egg; formed by the union of night, or chaos, and ether, which at length burst, and disclosed the forms of nature. The meaning of this allegory probably is, that by the energy of the divine active principle upon the eternal mass of passive matter, the visible world was produced. Some writers have ascribed to Orpheus the doctrine since maintained by Spinoza, which confounds the Deity with the Universe, making him the *Τὸ Πᾶν*. But the doctrine of emanation, which supposes that the principles of all things were originally in God, and at length flowed from him, is consonant to the general tenor of the Orphic fragments, and is the more likely to have been the real doctrine of Orpheus, as it prevailed, in the most remote times, through the East, and passed thence to the North. The human soul, Orpheus, after the Thracians and Egyptians, from whom he derived his philosophy, held to be immortal. Diodorus Siculus relates, that he was the first who taught (that is, among the Greeks) the doctrine of the future punishment of the wicked, and the future happiness of the good. That this doctrine was commonly received among the followers of Orpheus appears from the subjoined anecdote. A priest of Orpheus, who was exceedingly poor and wretched, boasting to Philip of Macedon that all who were admitted into the Orphic mysteries would be happy after death; Philip said to him, "Why then do you not immediately die, and put an end to your poverty and misery?"

The planets and the moon, Orpheus conceived to be habitable worlds, and the stars to be fiery bodies like the sun: he taught that they are animated by divinities; an opinion which had been commonly received in the East, and which was afterwards adopted by the Pythagoreans, and other Grecian philosophers.

ORPHEUS, in *Ichthyology*, the name of a fish caught in the Archipelago. It is of a broad and flat figure, and of a fine purple colour; its eyes are large and prominent, and its teeth serrated; it has only one fin on the back, and the anterior rays of that are prickly, and others soft to the touch; its anus is small, and is said to have no passage for the semen.

This was the fish called orpheus by the ancients, but the modern Greeks call another fish by that name. It is a species of the sparus, of a flat figure, but very thick, has a small mouth, and is covered with small, but very rough scales,

scales, which adhere very firmly to the flesh; the tail is not forked; it has fleshy lips, and very small teeth; its back and sides are black; its belly white; it has a large black spot at the root of the tail; its head is reddish, and its fins are very elegantly diversified with various colours; it has only one back-fin, and that has the anterior ray prickly, the hinder ones not at all so. It grows sometimes to twenty pounds weight, and is much esteemed among the modern Greeks.

ORPHIGNES, Fr. *Orphics*, in *Literature and History*. By orphics are generally understood the poems and detached verses which the ancients and moderns have ascribed to Orpheus.

ORPIERRE, in *Geography*, a town of France, in the department of the Higher Alps, and chief place of a canton, in the district of Gap; 7 miles S. of Serres. The place contains 858, and the canton 2965 inhabitants, on a territory of 115 kilometres, in eight communes.

ORPIMENT, in *Chemistry* and the *Arts*, a yellow mineral, from which the colour called king's yellow is prepared. It is a compound of sulphur and arsenic. See ARSENIC, *Sulphuret of*.

ORPINE, in *Botany*, &c. See SEDUM and TELEPHIUM.

ORR, in *Geography*, a town of Arabia, in the province of Yemen, the residence of a Dola; 24 miles W.S.W. of Sana.

ORR Water, a river of Scotland, which runs into Solway Frith, 10 miles E. of Kircudbright, N. lat. $54^{\circ}55'$. W. long. $3^{\circ}50'$.

ORRA, a mountain of Arabia, in Yemen; 20 miles N.E. of Abu-Arifch.

ORRACH, or ORACH, in *Botany*. See ORACH.

ORRERY, in *Astronomy*, a machine for representing by wheelwork the various motions of the heavenly bodies. This machine differs from a planetarium in this respect, that it exhibits the diurnal as well as annual motions of the earth, the revolution of our moon, and sometimes the rotation of the sun and of certain planets on their axes, as well as the revolutions of the latter, whereas a planetarium produces only the revolutions of the primary planets round the sun. The larger, or what has been called the "Grand Orrery," exhibits moreover the motions of the secondary planets, but more particularly those of Jupiter. To constitute an orrery, it is not necessary, however, that the motions of all the primary planets should be included, provided the different motions of our planet, the earth, and of her secondary, the moon, be included; because on these motions depend all the problems that relate to geography, navigation, and astronomy, the earth being the situation, though a moveable situation, from which all the phenomena are viewed, that successively arise out of the different motions of the other distant bodies, considered as contemporary with the motions of the earth herself. Hence all the vicissitudes of summer and winter, of spring and autumn, of day and night, the risings, settings, and culminating of the heavenly bodies, together with their constantly varying altitudes and azimuths, their right ascensions, declinations, and amplitudes, their conjunctions and oppositions, their transits and occultations or eclipses, constitute matter of illustration for the orrery, which renders it a machine of the first importance in science; and when all the wheelwork is so accurately calculated and properly arranged, that the motions in the machine are exact representations of the true motions of the heavenly bodies themselves, it affords one of the most pleasing, as well as instructive, objects of contemplation that human ingenuity has contrived, inasmuch as it comprehends in miniature the outlines of the whole solar system, and explains in a familiar

manner a multiplicity of interesting particulars relating to the composition of the universe; particulars which have required centuries to discover, and the skill of successive mathematicians satisfactorily to explain.

It is not our intention to give in this place a history of all the machines that have been contrived by human skill, to illustrate the different systems of planetary motion, which the ancient philosophers of different nations adopted, as the result of their imperfect observations and reasoning; many of which will be introduced in historical order, under our more general article *PLANETARY Machines*, to which the reader is referred; but to describe such machines only, as illustrate the true or Copernican system, agreeably to the definition we have given of an *orrery*, as distinguished from a *planetarium*, the latter of which will also be fully described in its place. See *PLANETARIUM*.

The internal construction of an orrery has hitherto been considered as composed of mechanism too complex to be intelligibly described in a dictionary of the arts and sciences, but we flatter ourselves, that our division of the different planetary machines into appropriate articles, and our having described the theory of planetary calculations, and of planetary mechanism under the heads *EQUATION Mechanism*, and *NUMBERS Planetary*, will enable us to remove objections of this nature, and to render perfectly intelligible, not only the effect produced by any particular contrivance, but the results accruing from the united agencies of all the mechanical parts of any of the machines, that appear to be worthy of minute description.

The appellation of *orrery* conveys in itself no idea indicative of the nature or use of the machine that it designates, but arose out of the following circumstance. About the year 1715 an instrument was contrived and made by Mr. George Graham, that represented at the same time both the annual and diurnal motions of the earth, and also the synodic period of the moon, which motions had never before been exhibited together by any mechanical contrivance, at least in England. This instrument was put into the hands of a workman to be packed and sent to prince Eugene, along with some other instruments. Whether this workman was Rowley, or some other person employed by him, does not appear; but it is said that he copied the model put into his hands, and from it Rowley made a machine for the earl of Orrery, with additions of his own invention. Sir Richard Steel, who knew nothing of Mr. Graham's instrument, wishing to do justice to the inventor, as he thought, of such an ingenious and complicated piece of mechanism, named it an *orrery*, and attributed to Rowley the honour which was due to Graham. This is Dr. Defaguliers's account of the origin of the orrery, from which it may be inferred, that Graham invented the parts of the machine which relate to the earth and moon, and that Rowley added those which produce the motions of the other planets; but whether the inferior planets only, or the superior also, were at first added, does not certainly appear. We have been favoured with a minute inspection into, and examination of, the orrery that was made from Rowley's plan many years ago for an Indian nabob, by order of the East India company, but which was never sent out by reason of the said nabob's death. This machine has not the wheelwork for exhibiting the superior planets, but corresponds with the drawing given in Bion's book of mathematical instruments, and also with the short notice which is there given of its external parts and use. The case is of ebony, surmounted by an ecliptic circle of solid silver, $1\frac{5}{8}$ inches broad and 29 inches in diameter, on which are neatly engraved the graduated signs of the ecliptic,

tic, and a circle of declination, but no months, or days of the month: this ecliptic circle is supported by twelve pillars, apparently of solid silver, and the twelve sides of the case have each an appropriate animal of silver to correspond to the twelve signs; the intervening corners being ornamented with as many silver pilasters, each six inches long, in the form of caryatides. These expensive ornaments around the exterior of the case, are calculated to raise the expectation that the interior parts may have been contrived and arranged with peculiar attention to accuracy, but the account we have to subjoin, we fear, will disappoint the reader. It would not be an easy matter to convey, by a verbal description, a clear notion of the relative situations and proportions of all the wheels, pinions, bars, and other internal parts of the mechanism, as presented to the eye when the cover is removed; nor is it necessary in order to give a true account of their accuracy; but our examination of the numbers of teeth contained in the various wheels and pinions, and of the manner in which those most essential parts are placed to perform their respective offices, has enabled us to make such a correct report, as we trust will be intelligible to such of our readers as have perused with attention our article *NUMBERS Planetary*, where the different modes of appreciating the value of wheelwork, acting under different circumstances, are exemplified.

We propose to describe Graham's portion of the machine first, as being the most essential, as well as of prior date, and then to add our description of Rowley's, together with such remarks as seem necessary to explain the construction of each portion.

Graham's Portion.—In examining this orrery, we began our operations by finding out what sort of connection the handle has with the diurnal motion of the earth, which motion, in all machines of this nature, is made the standard by which all the other periods are examined and estimated. We found fifteen wheels and pinions employed in communicating the motion of the handle to the earth's axis: but as none of these were found to be concerned in the train constituted of the ratio between a day and a year, they are no otherwise worthy of particular notice, than as being many of them superfluous, and as giving a false reckoning of the number of the earth's diurnal rotations. In order to indicate solar time correctly, it is necessary that the hour index on the earth's axis, or wherever it is placed, should revolve round a fixed face once in every rotation of the earth round its axis, or otherwise, that the face should revolve, with a fixed index, in this period: but in the instance before us, the handle or arbor of the index is in a stationary position, while it is connected, by the intervention of the wheels in question, with the earth's axis, as borne by the annual bar, and placed therefore in a variable situation, as it regards the sun, the centre of its motion; from which arrangement an annual difference of four entire days arises in the motions of the handle and of the earth; which may be thus explained: one of the wheels, which takes the motion of the handle, and conveys it to the earth's annual arm, is necessarily concentric with the sun's stem, and has the said arm revolving round it in a year; its number of teeth is 96, and the pinion which it actuates has 24 teeth: this pinion has its teeth in action with those of wheel 96, while it is carried round in the annual orbit, and therefore experiences a subtraction of $\frac{96}{24}$, or four entire revolutions, not contemplated by the contriver, or if contemplated not remedied; which subtraction, acting in a direction contrary to that of the motion derived from the handle alone, makes the earth have four rota-

tions in the year fewer than the index counts on the horary circle. The error thus occasioned in the indication of time, however, attaches fortunately to the handle, and not to the earth's axis, the motion of which is governed by the annual train. We notice this circumstance the more particularly, because Bion has given an erroneous account of this part of the mechanism, when he says, that "one entire turn of the handle of this instrument answers to the diurnal motion of the earth about its axis," which assertion has hitherto been generally credited. Nay, to an accurate examiner it is evident, without an inspection of the means, that a correct effect is not produced in counting time by the hour plate, for the circle of hours placed at the earth's axis makes 91 revolutions only, while the handle makes 92 nearly. But this error is not of so much importance in the motion of the handle as it would have been in the earth, or hour circle, while the two latter are correspondent. The wheelwork, which constitutes the effectual part of the ratio between a year and a

day, are $\frac{18}{24} \times \frac{481}{1} = \frac{8766}{24} = 365\frac{1}{4}$, so that the year is a civil, not a solar year, which a true representation requires. The wheel of 24 teeth, connected with the earth's axis, drives that of 18, on the arbor of which is a single endless screw acting with the large wheel of 487, which wheel is $17\frac{1}{4}$ inches diameter, and fixed fast, so as to resist the power of the screw, which is therefore itself obliged to move, and the

annual frame along with it, the space of $\frac{1}{487}$ of a circle in every 18 hours, or time of a revolution of the spiral thread. The shape of the teeth of this large wheel is that of a common saw, and it has evidently been divided and cut without an engine, for the dividing marks are still visible. The parallelism of the earth's axis is preserved by means of five wheels, of each 60 teeth, the first of which is fixed on the central arbor of the large wheel of 487, and the others are carried by the annual frame, so that they revolve each in a civil year, except the fixed one, which is the cause of motion to all the rest; the second and fourth wheels revolve in a forward, and the third and fifth in a backward direction; consequently the parallelism is perfect, but might have been effected with fewer wheels.

The wheelwork for the moon's period is $\frac{35}{12} \times \frac{75}{49} \times \frac{153}{25}$ of a day, the value of which train is $27^d 7^h 42^m 51^s.42$, and the error in excess is $13^s.26$. This period, it will be observed, is a periodic, not a synodic revolution, and it required some observation, as well as skill in planetary calculations, to ascertain first how the synodic revolution, or lunation, is effected by wheelwork, that answers to a periodic revolution, and secondly, the precise length of that synodic revolution: in the first place, the periodic is converted into a synodic revolution thus; some of the wheels of the moon's train are placed upon the wheel that preserves the earth's parallelism, which wheel, we have said, has a backward motion once in a civil year; it consequently carries its load of wheels round the earth once in a year, in a retrograde direction: but the last wheel of the train, which has 153 teeth, is a ring indented on the interior circle, and moves concentric with the earth, in a period that would be $27^d 7^h 42^m 51^s.42$, if it experienced no drawback in each revolution: but the pinion of 25, which actuates this wheel of 153, is annually carried backwards by the wheel of parallelism, while its teeth are in action, and therefore the wheel of 153 has its periodic motion, arising from the train simply considered, retarded by one

one entire revolution in a year; or, in other words, by the drawback in question, one entire revolution of the moon, as she regards the earth, is subtracted in every year, which subtraction, being effected gradually, makes every lunation longer than it otherwise would have been, by lessening the whole number of revolutions: let us see, secondly, if this transmutation of the periodic into a synodic revolution be performed with requisite accuracy; $27^d 7^h 42^m 51^s.42$ are equal to 27.4321428 , by which, if we divide 365.25 , the period of the earth's revolution, the quotient 13.368628 will express the number of periodic revolutions, as effected by the train of wheelwork exclusively: then if we deduct unity, the effect of one retrograde revolution in a year, produced by the wheel of parallelism, we shall have 12.368628 for the number of lunations in the same time, by which, if we again divide 365.25 , we shall have 29.53035 nearly, or $29^d 12^h 43^m 42^s.7$ for the time elapsed between two successive conjunctions of the moon, which lunation is quicker than a true one, as taken from the astronomical tables, by $20^s.1$.

The wheels for the motion of the moon's nodes plate, are $\frac{26}{98} \times \frac{93}{26} = \frac{93}{98}$, the retrograde period of which is $\frac{93}{5} = 18\frac{3}{5}$ years, or $6793^d 15^h 36^m$ (see NUMBERS Planetary), which period is too short by $4^d 13^h 17^m$ nearly, or a space in the ecliptic of $14' 28\frac{1}{2}''$, corresponding to this time. This error, in so slow a motion, is not indeed very considerable, as it is $18\frac{3}{5}$ years in amounting to less than a quarter of a degree. The wheel of 98 is made fast to the annual wheel of parallelism, and, by means of a pair of intermediate wheels of 26 teeth each, pinned together on the same arbor, communicates its motion to the wheel 93, which revolves once in a

year, and $\frac{5}{93}$, or five teeth more, which exceeds above one

revolution, in a retrograde direction, as it regards the moon's motion in her orbit, amounts to an entire backward revolution in the period already specified, which is therefore the time of retrogradation of the nodes of the lunar orbit. An inclined circular rim is carried by the wheel 93, as the representative of the moon's orbit, and the stem of the moon resting on its plane, rises and falls alternately, as the moon performs her synodic period, and indicates the latitude engraved on the face of the rim in question, which contrivance has been ever since adopted by the English instrument-makers. The wheelwork for making the moon keep her illuminated phase towards the sun in all parts of her orbit, by means of a little

black femiglobular cap, is $\frac{20}{86} \times \frac{28}{6} = \frac{560}{516}$, which at first

view appeared to be very erroneous, seeing the cap ought to revolve just once in each lunation; but a little examination soon convinced us that an allowance is here also to be made for a transposition of some of the wheels in each month; the wheel of 86, or first wheel of the train, is made fast to the annual wheel of parallelism, and the rest of the wheels are borne by the lunar ring of 153 teeth, before described, which it has been seen revolves in a forward direction, once in each lunation; when the train is reduced to the simple form

$\frac{560}{516}$, the 560 represents the lunar wheel 28, and the 516 the wheel of 86 on the annual bar, and to ascertain how much the former is accelerated by the backward transposition of the latter, we must say as $365\frac{1}{4}^d : 516 :: 29.53035 : 42$ nearly, so that in each month the product (which may be called the wheel) 560 is accelerated, as much as if 516 had been

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$516 + 42 = 558$, and the whole value of the train $\frac{560}{558}$

without transposition: but to make the parallelism complete, the products of the drivers and of the driven wheels ought to

have been alike, which they are not by $\frac{2}{560}$; the deviation

from perfect accuracy is, however, of less moment than it would have been in one of the planetary periods, because the cap is easily adjustable whenever the error becomes sensible.

After this examination and report of Graham's portion of the orrery, which is the most essential part, it will appear remarkable to the reader, that the inventor should have gained as much credit from his expensive and cumbersome construction of a machine, in which neither accuracy nor simplicity has been attained, as if he had contrived a perfect representation of the earth's and moon's motions in the simplest and most accurate manner; but the fact seems to have been, that the complexity of the construction has hitherto so puzzled every examiner of its internal mechanism, that all attempts to ascertain the periods corresponding to the wheelwork employed therein have proved ineffectual, until we undertook to disclose the value of each train by systematic rules, that we trust are intelligible by ordinary readers; and we beg to avow our disinterested love of truth, by asserting that, so far as we have examined this machine, it "has passed for more than it is worth."

Rowley's Portion.—The instrument-maker whom Dr. Defaguliers mentions as having added portions of his own to Graham's orrery, to render it more comprehensive, was, as we have said, Rowley, whose name is familiar among the instrument-makers of the present day: the portion which probably was first attached, as an appendage to Graham's, was the mechanism for effecting the sun's rotation, and the revolutions of the inferior planets, Mercury and Venus, to complete the system as far as to the earth's orbit inclusively; accordingly these are the parts of the orrery before us which remain to be described; but before we enter upon the examination and description, it may prepare the reader for what he has to expect, to premise, that the artist with whom we have now to do, has not profited much in point of simplicity from a contemplation of his predecessor's complexity of mechanism; they neither of them have borne in mind the useful maxim, that "more means are not necessary than are sufficient to produce an end;" but it may be alleged as an excuse for our present artist, that it is easier to devise and make a new instrument with all its dependent parts as a whole, than to adopt the ideas and calculations of another artist, and make them, imperfect as they may be, the basis of further calculations for additional movements, that did not enter into the original design; which is the difficulty under which Rowley must have laboured, when he undertook to introduce into Graham's machinery the wheelwork for the sun and inferior planets.

We will begin with the movement of the sun, which is

$\frac{94}{1} \times \frac{12}{60} \times \frac{26}{26} \times \frac{24}{24} \times \frac{60}{36}$, but we may omit the portion

$\frac{26}{26} \times \frac{24}{24}$, as being of no value in the calculation, and serving

only to transfer the motion communicated to them; then the remaining or effective portion of the wheelwork will be

$\frac{94}{1} \times \frac{12}{60} \times \frac{60}{36}$, or $\frac{94}{1} \times \frac{12}{36} = 31\frac{1}{3}$, which are so many

days by reason of the single screw denoted by unity revolving in a day, and this would have been the exact period of

4 F

a rotation

a rotation produced by the mechanism, if the wheels had been all in a permanent situation; but because many of them are carried by the earth's annual bar round the sun, whilst their connection with the last moving or central wheel of 60 is preserved, an additional motion is thus produced in it, independently of the proper motion depending on the preceding calculation, which additional motion or *acceleration* may be thus estimated; the wheel of 94 revolves once in every year by means of its position on the annual bar, and also that of 60, which is contemporary by being placed on the same common arbor; but the pinion of 12 is actuated

by this last wheel $\frac{60}{12}$, or five times round in a year, as is also its contemporary wheel of 36, which again drives the last wheel of 60; hence $5 \times 36 = 180$ teeth of the last wheel are brought into action by these means in every year; but the last wheel has got only 60 teeth, therefore $\frac{180}{60} = 3$

are so many entire rotations *per annum* produced by the *man-ner* in which the mechanism is placed, besides the 11.625, or $\frac{365.25}{31.33}$ rotations occasioned by the proper action of the train; the whole number of rotations, therefore, are $11.625 + 3 = 14.625$, by which, if we divide 365.25 days, we shall obtain $24^d 23^h 23^m 4.56$ for the whole period of the sun's rotation, as produced by the conjoint operations of the train and annual bar.

In the same way must the whole periods of the two inferior planets be ascertained; for the long train which actuates the sun's rotation is common to both these until we arrive at the last pair of each: the movement of Mercury, if we put down again all the wheels concerned in producing

the motion of this planet, will stand thus, $\frac{94}{1} \times \frac{12}{60} \times \frac{26}{26} \times \frac{24}{24} \times \frac{88}{15}$, the effective portion of which is $\frac{94}{1} \times \frac{12}{60} \times \frac{88}{15} = 110.293$ days for the period produced in the regular way: the acceleration here, estimated in the same way as that of the sun was, is 5×15 , or 75 teeth in the last wheel, or wheel of 88; consequently $\frac{75}{88} = .8522727$ of a revolution constitutes the *acceleration* in this case, which added to 3.3116234 (or $\frac{365.25}{110.293}$) revolutions produced by the regular action of the train, amounts to 4.1638961 revolutions *per annum*; and $\frac{365.25}{4.1638961} = 87^d 14^h 47^m 24.59$ is the whole period arising out of the compound motion.

Again, the other planet Venus has for a whole train $\frac{94}{1} \times \frac{12}{60} \times \frac{26}{26} \times \frac{24}{24} \times \frac{225}{15}$, or in effect $\frac{94}{1} \times \frac{12}{60} \times \frac{225}{15} = 282$ days without the acceleration, which in this instance, is $\frac{75}{225}$, or $\frac{1}{3}$ of a revolution; we have then $\frac{365.25}{282} = 1.295212$ revolutions without the acceleration or quantity .333333, which together make 1.628545 revolutions *per annum*, or one

revolution in $\frac{365.25}{1.628545}$, or in $224^d 6^h 36^m 59.72$ from the joint effect of both causes of motion.

We are not quite certain whether or not the reader will fully comprehend the nature of the acceleration here described, from any verbal description that could be given; but the artist who may have opportunity to notice the wheels in motion, will have no difficulty, after perusing this account, in completely understanding the separate sources of motion, however he might have been previously perplexed to assign to each its due quantum of the joint effect.

And now that we have arrived at the result of our examination, it appears by a comparison of these periods with the exact times of the respective revolutions, collected from the astronomical tables, that they are by no means so accurate as might have been expected from such elaborate calculations, and such complex mechanism.

Besides these portions of mechanism, there are some wheels connected with the sun's axis, which carry round a support for a little lamp, to be kept always fix signs from, or opposite to the earth, and to illuminate one of its hemispheres, when a three-inch globe is put on as the earth's representative, which is an occasional apparatus; the usual globe being $1\frac{1}{4}$ inch ball of ivory; the movement, to answer

this purpose, is $\frac{12}{60} \times \frac{73}{1}$ of the sun's rotation, *viz.* $\frac{876}{60}$

of $24.97435 = 364^d 15^h 0^m 44^s$, which deviates from what it ought to be, about 15 hours motion in a year; but this deviation is of little consequence, as the intention of the lamp is only to illuminate the earth, while the vicissitudes of day and night, and the succession of the seasons, &c. are under consideration. The lamp has a convex lens placed, we presume, at the distance of its focal convergence from the light, so that the rays which pass through may proceed parallel to each other to the little globe.

The last wheels, or rather rings of Mercury and Venus, have their planes inclined, so that the stems which bear the planetary balls, being screwed into them, rise and fall respectively, as the rings revolve by means of friction-rollers, for the purpose of shewing the variations of latitude; they are also placed a little excentrically with respect to the sun. The perihelion distance of Mercury is $2\frac{1}{4}$, and the aphelion distance $2\frac{9}{10}$ inches by measurement, which should have been very nearly to each other as 4 to 6: Venus is at the mean distance $5\frac{1}{2}$, and the Earth $9\frac{1}{4}$. As it has been before observed, there is no graduated circle for indicating the day of the month, so that this instrument, we must conclude, was never intended to point out the *particular day* on which any phenomenon is exhibited, but merely to give a general representation of celestial appearances; which purpose, notwithstanding its inaccuracies, it is calculated to do in a pleasing manner by the aid of its external appearance. We cannot dismiss the consideration of this machine, without remarking further one peculiarity which struck us on first counting the teeth of the two last wheels in each of Rowley's movements;

which for Mercury are $\frac{88}{15}$, for Venus $\frac{225}{15}$, and for the Sun $\frac{60}{36} = \frac{25}{15}$. It occurred to us at the time of examination, that the last movers were intended to represent exact days; the periods being to each other in the nearest whole numbers, as 25, 88, and 225 respectively; and we are still of opinion that the artist intended they should be so during his labours; for it is much more probable that these numbers were *first fixed upon*, and afterwards connected with the diurnal motion

by intermediate wheels to answer this purpose in the best way that could be devised, than that such complex data, as a compound motion affords, should be fixed upon for the ground-work of the calculations: indeed it is improbable in the extreme that *all* the last wheels, so circumstanced, should have been obtained by any regular arithmetical process, other than voluntary assumption of these numbers, with a determination to make them answer by subsidiary additions; which circumstance accounts pretty well for the great number of wheels introduced which form no part of the calculation, and at the same time renders it exceedingly probable that the inventor himself, not attending sufficiently to the *composition* of the motions, believed that the periods were respectively 25, 88, and 225 days, and the probability gains additional strength, from the consideration that, supposing the sun's rotation to be performed in exactly 25 days, the

mechanism for carrying round the lamp, viz. $\frac{12}{60} \times \frac{73}{1}$ of

25 would in that case give a revolution in exactly 365 days; which, therefore, most likely, was the period intended; indeed such a concurrence of four whole periods without a fraction, under such a complexity of circumstances, puts the matter almost beyond a doubt.

Rowley's grand Orrery, made by Wright.—In the month of July, 1813, we were favoured with a peep into the interior construction of the superb orrery at Richmond observatory, made by T. Wright, mathematical instrument-maker to his majesty George III. in the year 1733; it was our intention to have analysed the wheelwork, so as to have taken a particular account of each train, but when the covering parts were taken off, we found that the time allowed us for such labour was inadequate, even if we had been admitted to take the constituent portions into detached pieces for examination. The mechanism for the Sun, Mercury, and Venus, appeared to be similar to what we have already described, and could not be minutely inspected in an attached state, as several of the wheels were concealed by cocks and other parts that were not allowed to be undone. It was of importance, however, to ascertain the diurnal and annual wheels of the earth as accurately as we could, since the other periods take the earth's motion as the standard of their time. At the first peep into the interior of the machine, not only an unexpected multiplicity of wheels presented themselves to the eye, but many of them were so enormously large, that we at first despaired of being able to count any of their teeth in a satisfactory manner; but having with us a pair of spring-dividers, we adopted the plan of taking in twenty teeth at once between their points, which scheme considerably lessened our labour, and enabled us to bring away with us several of the numbers. Beyond the orbit of Venus there are nine large concentric rings indented, revolving round rollers placed on studs on the bottom of the machine, and regularly increasing in diameter till the ninth, or last, which is a fixed one, nearly filling the space within the surrounding ecliptic, which within is 42 inches in diameter. The handle enters the side of the ornamented case, and takes hold of an horizontal arbor which lies across these rings, but beneath them, having three different contrate wheels fast to it in sight, and being connected with several pinions, in a way not seen; some of which are supported under the bottom plate by a sliding bar, that brings them into or out of action, with their large rings respectively; the contrate wheels also will slide into or out of action separately. If we begin to count from the largest, or fixed rim, calling it one, the sliding pinions drive the moveable rings thus;

a pinion of 9, appearing to revolve, by means of the concealed mechanism, in 172 days, or turns of the handle, actuated, when forced home into action, the third ring of 560 teeth; the period corresponding to which numbers is $\frac{560}{9}$

of 172 days = 10702.2. This period we can hardly suppose to be the exact one intended by the maker of the machine; but if the pinion of 9 be made to revolve 172.8 days, which is equally practicable, then the period thus rectified will be 10746.8 days, nearly as in nature: this ring carries the ball of Saturn, on a stem connected with it, at the distance of 17.5 inches from the sun. Again, a pinion of 8, on the concealed sliding bar, drives the fifth ring of 480 teeth in apparently 72 days; but the corresponding period $\frac{480}{8}$ of 72 = 4320, is too little by 10.6 days: we must,

therefore, suppose that the pinion of 8 revolves in $72\frac{1}{4}$ days, and then the rectified period will be 4330.6 days for Jupiter, whose stem is 12.9 inches from the sun. For Mars, the seventh ring, with 365 teeth, is driven by a pinion of 10 in $\frac{365}{10}$ of 19 days apparently, or in 693.5 days, the planet

being at $10\frac{1}{4}$ inches from the sun; but this is too inaccurate also, therefore substitute 18.82 days for the period of the pinion, and the rectified period will be $\frac{365}{10}$ of 18.82, or

686.93 days, pretty nearly the truth. Thus have we been able to ascertain the values of the concealed wheels, which may be represented very easily by wheels of common numbers, deriving their motions first from the horizontal diurnal arbor, and then from one another, from the quickest to the slowest movers in succession. The eighth ring, which is driven by a pinion of 20, always in action, has also 365 teeth, and the time in which the pinion revolves was ascertained to be 20 days, so that each tooth of the wheel represents an exact revolution of the handle, and also, as we shall soon see, a solar day: on this wheel the annual arm is supported, and likewise the mechanism for the revolutions of the Sun, Mercury, and Venus, as before described, but their periods will not be exactly the same, because here the year consists of only 365 days; whereas in the smaller instrument it had $365\frac{1}{4}$ as the standard period. We will return to the diurnal motion, when we have described the remaining indented rings: the first, which we have said is fixed fast, is used for preserving the parallelism of Saturn's ring, for doing which several wheels and an endless screw are introduced; but as it was only to produce a fraction of high numbers, where the numerator and denominator are necessarily alike, we thought it of no importance to count those numbers. The second ring revolves by the action of the first contrate wheel on the horizontal diurnal arbor, which has thirty teeth; but as the wheels for producing the periods of the five satellites of Saturn (the two nearest not being then discovered), are numerous, and the planes of the orbits improperly placed horizontal, we thought it advisable to lose no valuable time in examining them, particularly as no phenomena of importance are illustrated thereby; we, therefore, proceeded to Jupiter's satellites, which are of more importance in any machine. The fourth ring, from which these take their motions, has 540 teeth, driven by the second contrate wheel of 36 placed on the diurnal arbor: again, this ring gives its motion unaltered to a pinion of 21 borne by Jupiter's arm, which pinion, therefore, has a combination of two

motions, one derived from the diurnal arbor, the value of which is $\frac{21}{36}$ of a day, and the other $\frac{540}{21}$ in Jupiter's whole period, in consequence of the 21 being carried round 540 in that space of time. This portion of the motion is a deduction by reason of the pinion receiving a *retrograde* motion from the handle, or cause of the quicker motion, but a *direct* motion from Jupiter's slow motion in the orbit, and the *difference* of these two is the absolute motion of the pinion before us to be ascertained: but before we ascertain this difference, let us see what the period would be of the arbor that carries the four drivers of the satellites, without considering the deduction in question; for in all probability this deduction was not in the mind of the contriver when the

numbers were calculated: $\frac{21}{36}$ of a day is just 14 hours, for

the period of the pinion of 21, on a supposition of its being in a stationary situation, and the wheels that transmit the

motion along Jupiter's arm are in effect $\frac{48}{28}$ or $\frac{12}{7}$, and $\frac{12}{7}$

of 14 hours is 24, or an exact day: on the arbor of the last wheel of 48 are placed four drivers to actuate each its fellow in its own period: the pairs are those with the values placed opposite them; *viz.*

				D. H. M.
1. Satellite	$\frac{84}{48}$ of 24 ^h	-	-	1 18 0
2. Ditto	$\frac{85}{24}$ of 24	-	-	3 18 0
3. Ditto	$\frac{86}{12}$ of 24	-	-	7 4 0
4. Ditto	$\frac{100}{6}$ of 24	-	-	16 16 0

As all the numbers, that we have here examined, have corresponding values in time, without a remainder, and as the time of the first mover comes out an exact day, it may be considered as certain, that these were the results calculated upon by the contriver, who, in every instance throughout the machine, has neglected the consideration of minutes and seconds in his calculations of the periods. But we proposed to ascertain the real periods, when the allowance is made for the drawback occasioned by the motion of

Jupiter's arm, which is thus calculated: $\frac{540}{21} = 25.714285$

&c. is the number of revolutions in a forward direction, made by the pinion 21, in Jupiter's period of 4330.6 days, as before determined; then one of these revolutions being performed in 14 hours, as we have seen, we shall have $25.714285 \times 14 = 359.99999$, &c. or 360 hours for the deduction in the aggregate reduced to hours: therefore, as $4330.6 : 360^h :: 14^h : 2.90673$; that is, if Jupiter's period produce a drawback of 360 hours, one rotation of 14 hours will have a drawback of 2.90673 minutes, which, taken from 14 hours, leaves 13.951555 hours as the corrected period of the pinion of 21 to revolve in, instead of 14 hours, which would have been the period if Jupiter had not had a revolution in his orbit. We have now, therefore, the subjoined periods from the same wheelwork, which are

really fractions, not of 24 hours, but of $\frac{48}{28}$ of 13.951555,

which comes out 23.^h916951, or 23^h 55^m 1^s. Hence we have,

				D. H. M. S.
1. Satellite	$\frac{84}{48}$ of 23. ^h 916951	-	-	1 17 51 16
2. Ditto	$\frac{85}{24}$ of ditto	-	-	3 12 42 21
3. Ditto	$\frac{86}{12}$ of ditto	-	-	7 3 24 17
4. Ditto	$\frac{100}{6}$ of ditto	-	-	16 14 36 57

These periods are not so accurate as those which we gave before, nor is either of the sets so accurate as might have been expected in a machine of the value of 1500*l.*, which, we were informed by an instrument-maker, who was present, must have been about the original price. The sixth ring, which has 432 teeth, is impelled by the third contrate wheel on the horizontal diurnal arbor of 46 teeth; and a wheel, or rather pinion of 23, receives the motion through the medium of the ring 432, as was the case with Jupiter's 540; and a similar allowance for the drawback is to be made here for the time of revolution of the pinion 23, as

was there for the pinion of 21. The period $\frac{23}{46}$ of a day

is 12 hours, which would have been the period of the revolution of pinion 23, provided the arm of Mars had not been carried in its revolution round the wheel 432, in his period. But we must ascertain the correct period by calculation, as

we did the 21 of Jupiter, thus: $\frac{432}{23} = 18.78260$ are the

revolutions to be deducted of each 12 hours, or, which is the same thing, 9.3913 days' motion in the time of the period of Mars, which we have taken at 686.93 days. Hence, as $686.93 : 9.3913 :: 12^h : 0.15405$; and the third term, diminished by the second, leaves 11.83595 days as the correct period for the time of a revolution of pinion 23;

then, $\frac{24}{50}$ of this time is 24^h 39^m 29^s for the revolution of

Mars, which, without the correction, would have been 25 hours exactly, furnishing another proof of the author's intention.

For want of sufficient time, we omitted to notice particularly whether or not the planets, Saturn and Jupiter, had their motions round their axes produced by wheelwork, like Mars; but the impression on our mind is, that they had, though we could not take down the numbers at the time.

We return now to the earth's motion, as we proposed. We have already said, that the large wheel, which revolves in a year, has 365 teeth, and that each tooth represents a day. The ninth, and last ring that he have to mention, is within this annular ring, and has the same number of teeth, namely 365: its use is to take a tooth from the contrate wheel of 96, on the diurnal arbor, (or otherwise moving contemporary with it,) and to give it to a wheel on the earth's axis, or rather to a wheel on a tube that ascends to the earth's axis, and that communicates this motion to the axis by the medium of three equal pinions. It was difficult to obtain the number of teeth of the tubed wheel, which at first we suspected was 96 also; in which case, there would

have been an error in the diurnal train of $\frac{365}{96}$, or $3\frac{7}{96}$ days

in

in a year, similar to the drawback we have noticed in the case of Jupiter's moons, and the rotation of Mars; because while the first 96 is stationary, and the second moveable, by being put on the annual bar, it is clear that this last has a compound motion, composed of + 365 from the handle, and $-3\frac{7}{8}$ arising from the annual circuit round the ninth ring of 365. To satisfy ourselves as to the result of this combination, we turned the handle 365 times, and counted just 365 rotations of the earth in the same time; which correspondence convinced us, that there must exist a compensation that does not appear at first sight; and it was not till we had returned home, that the means necessary for effecting this compensation occurred to us, but which we are fully satisfied are the means adopted. The deduction, we have seen, is $3\frac{7}{8}$ revolutions of the wheel on the annual bar, in each 365 days: now $3 \times 96 + 77 = 365$; therefore, this deduction is at the rate of one tooth *per* day: and to balance this deduction of one tooth *per* day, there must somehow be, by way of balance, an acceleration or addition of one tooth *per* day, which is done simply thus: let the tubed wheel, on the earth's annual bar, be 95 instead of 96, while the wheel in the fixed situation remains as we counted it 96, and the

consequence will be this; the *deduction* will now be $\frac{365}{95}$

$= 3\frac{8}{95}$ revolutions of the earth's axis, by the effect of the annual motion on this wheel of 95, and $3 \times 95 + 80 = 365$, as before; but for every turn of wheel 96, on the diurnal handle, wheel 95 makes an entire rotation, and *one tooth more*, or receives an *addition* of one tooth *per* day, from the diurnal motion only: hence from the diurnal motion arises an acceleration of one tooth *per* day in the earth's rotation; but from the annual motion arises a retardation of one tooth *per* day, which would not have been the case, if the ninth ring, for the transmission, had not had as many teeth as days. The balance, therefore, is exact; and it now appears why the wheel for the transmission of motion from the 96 to the 95 was made with 365 teeth, in preference to any other number. Nay, if the year had consisted of $365\frac{1}{4}$ days, the compensation would not have been perfect, as we presume it now is, in consequence of the numbers we have every reason to conclude are adopted, except that we have not actually counted the wheel 95, concealed under the moon's mechanism, which we were not authorized to displace. By this compensation, the diurnal handle and the earth's axis make each 365 rotations in the year, and the only error remaining would be a quarter of a degree nearly, in each year, in the ecliptic circle, which probably on this account has no annual index, nor any days of the month inserted. Thus the more minutely we examine the distinct portions of this mechanism, the more clearly we see the reason, not only of various contrivances, and of many of the numbers adopted in this particular construction, but also of the omissions of parts generally deemed necessary in more recent constructions. The omission of a quarter of a day in the year, and also of the daily hand and ecliptic index, is an omission arising entirely out of the manner in which the motion of the handle is transmitted to the earth's axis, as is also the want of a sidereal horary plate; that of the sun being made fast to the cover, supported by the annual bar, and the horary index being put on a vertical diurnal arbor at some distance from the earth, which is an ivory ball of about an inch and half diameter, neatly engraved, with the principal lines and countries on its surface, and fitted up with a circle of illumination, and placed at the distance of $6\frac{3}{4}$ inches from the sun; while the distances of Venus and Mercury are at $3\frac{1}{4}$ and 2.2 respectively. We

come, lastly, to the moon, which performs her lunation in $\frac{96}{24}$

$\times \frac{118}{16}$ of a day, which period is $29^d 12^h$; and the

inclined plate for the moon's latitude is carried backward, for the motion of the nodes by the wheels $\frac{95}{100}$

in $\frac{95}{5}$, or 19 civil years. The wheels $\frac{93}{98}$, however, which

are equally convenient, would have produced a much more accurate result in $18\frac{3}{5}$ years. A cap of parallelism moved round in each lunation, by three equal small wheels on the lunar arm, the interior one being fast to a fixed tube, as we suppose, exhibits the phases for each day of the moon's age, which are indicated also on the cover, at some little distance from the horary circle. Above the ecliptic circle are erected a brass semicircle for half the equator, the solstitial colures, the summer tropic, and arctic circle, with the polar point; which appendages add to the appearance of the machine; and the works are admirably preserved by a case, with glass both above and round the body of the machine, which is superbly ornamented with chased work, in many figures resembling the fore-part of a horse, between each animal of the ecliptic signs; and our only surprise is, that so much money is expended with so little real effect. At each side of the handle is a brass knob: when the right-hand one is drawn out, the secondaries of Jupiter and Saturn, as well as the rotation of Mars, cease to move; and when the left-hand one is drawn in like manner, the superior planets themselves stop; but the earth and moon, with the inferior planets, move with the handle under all circumstances.

The reader of this account may have remarked, that the numbers used in the *grand orrery*, (as it has been very properly called, if we survey the exterior of it only,) has the numbers of the teeth in its wheels all *composite*, or such as are divisible by hand; and it is said that the wheels were all divided and cut, before an engine was used in England, which is the manifest reason why great accuracy in these numbers was not attempted: for prime numbers would have produced those difficulties in the execution, which the use of a perfect engine has now entirely removed.

Ferguson's Orrery.—James Ferguson invented various instruments from time to time for illustrating the phenomena of the solar system, and his works are in every one's hands, which contain the drawings and description of them; but that which is known by the name of Ferguson's Orrery is the most accurate, and merits our notice in this place; it comprehends the motions of the Sun, Mercury, Venus, Earth, and Moon, and is particularly described both in the author's "Select Mechanical Exercises," and in his "Tables and Tracts," to which the reader is referred for the plates and description of the mechanism, which is rendered sufficiently intelligible. On examining the numbers of which the wheels have their teeth composed, we found that the author has attributed to them greater accuracy than they really possess, for which reason we shall subjoin the wheelwork, together with the value of each train, as well as the periods attributed to the machine by Ferguson; from a comparison of which it will appear how necessary it is to estimate the value of any train of wheelwork in expensive machines by actual calculation, rather than take on credit the periods attributed to them by their author. It will be sufficient for our present purpose to give the numbers of the wheels and pinions of each train, with the corresponding periods, in a table.

TABLE

ORRERY.

TABLE of Fergufon's Trains, with their corresponding Periods in Time.

Motions.	Wheelwork.	Periods.
		D. H. M. S.
Earth's diurnal motion - }	$\frac{25}{8} \times \frac{69}{7} \times \frac{83}{7}$	365 5 48 58.78
A lunation -	$\frac{30}{64} \times \frac{63}{1}$	29 12 45 0
Sun's rotation -	$\frac{25}{8} \times \frac{69}{7} \times \frac{64}{78}$	25 6 35 36
Revol. of Venus	$\frac{25}{8} \times \frac{69}{7} \times \frac{73}{10}$	224 20 47 8
Rev. of Mercury	$\frac{18}{28}$ of Venus + 1	87 23 47 24
Rot. of Venus -	$\frac{8}{74}$ of its revol.	24 22 31 8
Moon's node -	$\frac{56}{59}$	18½ years.
Earth's parallelism	$\frac{40}{40} \times \frac{40}{40}$	1 revolution.

Besides these wheels and pinions there are others for subsidiary purposes, which do not enter into the calculations of the periods, and are therefore omitted in this brief account, which is intended only as an appendage to Fergufon's own description. The periods attributed by the author are as follow; viz.

	D.	H.	M.	S.
Earth's diurnal motion -	365	5	48	57
A lunation -	29	12	45	0
Sun's rotation -	25	6	0	0
Revolution of Venus -	224	17	0	0
Ditto of Mercury -	87	23	0	0
Rotation of Venus -	24	8	0	0

It may be said in favour of this statement, that the description is a popular one, and therefore sufficiently accurate for ordinary readers; but when the author undertakes to appreciate the errors of his wheelwork, which he has done, a more correct report of the periods is indispensable. The rotation of Venus, according to Bianchini's determination, which Fergufon has here adopted, is no longer considered as the proper rotation. There is considerable ingenuity shewn in the contrivance for making the rotations of the handle agree with those of the earth.

Mr. Benjamin Martin's Orrery, or Microcosm.—In the second volume of Benjamin Martin's "Mathematical Institutions" (p. 479, et seq.) we meet with a detailed account of some astronomical mechanism which he proposed to be attached to a clock, about the year 1764, under the name "Microcosm," or little world; but we do not find that the plan was ever put into execution. It was not intended to be the regular representative of all the solar system, with the motions in their due places, but such a representation only as would exhibit the planetarium portion in one place of the clock, the tellurian in another, and the lunarium in a third; and, as it should seem, a Jovian lunarium was intended to be occasionally substituted for the planetarium, to go by the motion of the clock. The au-

thor, however, after having proposed his plan, seems to have despaired of having any order given to make such a piece of mechanism, chiefly from a consideration, which is equally true in our own time; viz. that "by arts and artists we understand only engraving, painting, and sculpture, and those who practise them;" scientific mechanism being not usually comprehended under those terms, as being but little cultivated; and the more fashionable studies of chemistry and galvanism, we may add, at present engross the principal attention of the philosophical world. But though the microcosm was, perhaps, never constructed as an appendage to a clock, yet it laid the foundation of our more modern planetaria, tellurians, and lunaria, which constitute the orrery in three parts, as constructed by the workmen of Messrs. Adams, Jones, &c.; on which account we shall describe the different portions separately, and suggest such observations to the reader as may enable him to appreciate their accuracy. For a description of the planetarium portion, the reader, however, is requested to turn to the article PLANETARIUM, where our plan of arrangement has placed it as a separate instrument.

The Tellurian Portion.—Tellurian is a word which owes its origin, we believe, to B. Martin, and which implies a detached portion of mechanism, calculated to represent the annual and diurnal motions of our earth (tellus) only, and as such, was at first, as it still continues to be, an appendage to the planetarium, and forming with it and the lunarium the common orrery: the principal requisites for this instrument, or rather portion of an instrument, are a train of wheels for preserving the constant parallelism of the earth's axis, on which, together with its proper inclination, depends the change of seasons, and another train composed of an exact ratio between a solar day and a solar year, on which depends the continual alternate succession of day and night. For the desirable purpose of lessening the number of wheels which would be required in two distinct trains, the inventor has very judiciously fixed upon two wheels which shall be common to both trains, viz. 365 and 59; the former of these, which is necessarily large, has no motion itself, but communicates a circular motion to the 59, by means of their teeth being connected, whilst the latter is carried round it, by the annual bar, once in a year, and as these wheels are attached to the same stand which is used with the planetarium, the same handle and wheelwork which gives motion to the earth's radius vector there, will give motion to the annual bar here. A motion being once communicated to the wheel 59 in this manner, all the other motions of the wheelwork connected with this, and placed with it on the annual bar, will continue as long as the handle moves which actuates the annual bar. The trains made choice of are these; viz.

$$\text{For the Earth's parallelism - } \left\{ \frac{59}{365} \times \frac{62}{10} = \frac{3658}{3650} \text{ or } 1.002192 \right.$$

$$\text{Diurnal and annual train - } \left\{ \frac{59}{365} \times \frac{10}{20} \times \frac{8}{40} \times \frac{10}{59} = 365^{\text{d}} 0^{\text{h}} 0^{\text{m}} \right.$$

In the first of these trains the product of the numerators or driven wheels should have been exactly equal to the product of the denominators or drivers, in order that one retrograde revolution of the last moving wheel of 62 might be effected in exactly one direct annual revolution of the bar; or, in other words, the ratio should have been equal to unity, which it exceeds, and therefore the parallelism will not be constant, but will require a manual rectification as often as the error amounts to a sensible deviation. With respect to the other train, the value of which ought to have been $365\frac{1}{4}^{\text{d}}$,

365 $\frac{1}{4}$, or rather 365 $\frac{1}{4}$ 5 h 48 m 48 s , the effect of its error is, that the diurnal motion, compared with the annual motion, loses nearly a quarter of a day in every year, so that the horary index, if immediately connected with the tubed arbor of the last pinion of 10, and the annual index, are constantly at variance, and in the short space of four years, namely, on every bissextile, this disagreement amounts to a whole day. But the *quantum* of motion was not the only object of attention in the last, or diurnal pinion of 10, its *direction* also was to be attended to by the contriver, that the earth should have its rotations from west to east, otherwise they would not be natural; this, however, would not be the case without some additional wheel; for as the wheel of 59 revolves round the large wheel of 365 from west to east along with the annual bar, and with it the wheel of 20 placed on the same arbor, the first pinion 10, and wheel 40, on the second arbor, have their motion retrograde; then the third arbor with the pinion 8, and wheel 59, are again direct, and the last arbor, or tube, with its pinion 10, becomes in its turn retrograde; and if the earth had been immediately connected with this tube, its motion would consequently have been retrograde too. The two wheels of each 59 might indeed have been omitted, without affecting the calculation, one being a multiplier, and the other a divisor, and then there would have been one arbor fewer; but then the axis of the earth was to have an inclination, which it could not have if placed on the tube of the last pinion 10, two additional pinions, therefore, became necessary, one on the upper end of the tube, and the other on the retrograde bar of parallelism where the axis is fixed, on which the earth revolves; these two pinions are each 10, it being of no consequence what they are, provided they be similar; but hence arises a new motion, which the inventor probably did not suspect, when he made his calculation for 365 days; for as the bar of parallelism revolves *backwards* once in a year, and carries the pinion connected with the earth's axis backwards along with it, whilst its teeth are connected with the teeth of the central pinion on the tube, this pinion makes one retrograde revolution in a year *from this cause*, and brings the earth back again one entire revolution in that time, so that, in fact, the earth, by this mechanism, makes only 364 complete revolutions on its axis in each year, instead of 365, for which the calculation was made; hence, an horary index is altogether useless, if placed on the earth's axis; and if placed on the tube, which revolves 365 times, it would not correspond with the earth's rotations by one day in a year; and this defect being found out, was probably the reason why no horary index is described as belonging to this instrument.

But there remains yet a further deduction of a day in the year, in this instrument, to be explained, which reduces the number to only 363, but which is not connected with, nor dependent upon, the diurnal train: this arises entirely from the retrograde motion of the annual bar of parallelism; it is a truth, perhaps not much, if at all, noticed by instrument-makers, though not the less true on that account, that provided the earth had no diurnal motion at all during its annual progress, the circumstance of its axis being always parallel to itself, would produce just one day in a year, with this remarkable phenomenon, that the sun would rise, or appear to rise, in the *west*, and set in the *east*, which is just the reverse of the sun's apparent motion produced by the earth's rotation: this day, arising from the annual motion, would have added another day to the days in a year if the earth's rotation had been from east to west, and what is now the number of sidereal days, would then have been solar, without

the addition of this one, that is to say, an inhabitant of any part of the earth would transit the meridian solar ray 367 times; for the real rotations of the earth would produce 366 transits, and one more would be derived from the annual gyration which preserves the parallelism by presenting every point of the earth successively to the sun in the course of the year. On the contrary, because it happens that the earth's rotations are from west to east, and the annual gyration from east to west, in this case the *annual day*, as it may be called, is a deduction from the solar transits, which therefore are 366 - 1, or 365, omitting the fraction; hence in every instrument which exhibits the diurnal and annual motions, and also the parallelism of the earth, the actual rotations of the earth produced by the train of wheelwork should be 366, as in nature, seeing the bar of parallelism deducts one solar day in every year; but it has been shewn that the rotations of the earth, in the tellurian in question, are actually only 364, arising from the whole operation of the diurnal train, and two additional pinions, from which we must further deduct one for the drawback of the annual gyration, which deduction leaves only 363 actual solar days exhibited by the mechanism. The following alteration would obviate these defects of two days' motion arising from decomposition; let both the wheels of 59 be left out of the train; its value would not be affected thereby, but there would be only three arbors, including the tube, instead of four; the earth then would rotate 365 times the wrong way about, or from east to west, by means of the train, and once more the *same way about*, in this case, by means of the second pinion, on the bar of parallelism as it revolved round the central pinion of the same number fixed on the tube, which would make 366 rotations; add now a third pinion to the earth's axis, and it will revolve 366 times from west to east, and the annual gyration will make the necessary deduction, but still there would be a defect of 5 h 48 m 48 s in each year.

The Lunarium Portion.—Lunarium is also a word which we think occurs in the author before us for the first time; its import is an instrument which exhibits the motions of the moon (luna), or otherwise an appendage to another more comprehensive instrument, in which it performs this office when attached. The principal motions of this secondary planet are, 1 st , the monthly motion, which may be considered either as the period that begins and terminates with a star, or with the sun, the former of which is called the periodic revolution, and the latter the synodic revolution, or a lunation; 2 dly , the anomalistic revolution, which is shorter than a lunation, but longer than a periodic revolution, by reason of the line of the apsidæ having a progressive motion in the ecliptic, which the moon has to overtake; and 3 dly , a revolution in regard to the nodes, which is the shortest of all, by reason of the slow retrograde motion of the line connecting the nodes, which meets the moon in every lunation. These three periods have each a separate train of wheels, in

each of which the common pair $\frac{59}{365}$, used in the tellurian, forms the first portion; the three trains, with their values in time, are these, *viz.*

		D.	H.	M.
Moon's synodic revolution	$\frac{59}{365} \times \frac{20}{20} \times \frac{10}{20}$	29	12	0
Moon's apogee	$\frac{59}{365} \times \frac{70}{10} \times \frac{78}{10}$	3221	9	36
Moon's nodes	$\frac{59}{365} \times \frac{18}{6} \times \frac{30}{6} \times \frac{48}{6}$	7080	0	0

The large wheel of 365 is here again a fixed wheel, round which

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which all the other wheels are carried by the annual bar, as in the tellurian, which is taken from the stand, when the present mechanism is put on, and as the wheel 59 has its teeth in connection with the large wheel, it revolves the space of one tooth in every day, as the year advances, and finishes its revolution in 59 days, $\frac{1}{2}$ or $\frac{1}{2}$ of which is $29^d 12^h 0^s$, the synodic revolution, in which the error is $44^m 3^s$ nearly, an error of too much magnitude to be overlooked by a mathematician, if he had been anxious for the accuracy of his instrument. The next train is calculated to make an elliptic ring, representing the moon's orbit, advance through the 12 signs of the ecliptic in the period specified, which, according to La Lande, should have been 3231.35791 days, so that the error is nearly ten days in this period. The last train carries round an inclined circular plate or ring, moveable on an axis inferted at the nodes, to shew the moon's variation of latitude; the retrograde period of this plate, according to La Lande, should have been 6798.20337 days, the error therefore is still more considerable than in the last motion, its amount being a space in the ecliptic equal to 281.79663 days' motion.

From the examination which has here been detailed of Martin's planetary numbers, the reader, it is presumed, will not think the inference unfair, if we assert that the various inaccuracies which have been pointed out, shew the propriety of abandoning these numbers in future, and of substituting others which shall exhibit the various motions more faithfully.

Orrery for the Motions of the Sun, Moon, Earth, and interior Planets, by the Rev. W. Pearson.—During the time that Mr. Pearson resided at the city of Lincoln, he wished to procure an orrery at a moderate expence, and constructed from numbers which might have some pretensions to accuracy, but not being able to accomplish his wish, after a correspondence with an instrument-maker in London on the subject of his enquiry, he determined to try if he could not contrive an instrument himself to be made under his direction by an ordinary clock-maker. After some consideration he devised the mode of calculation, which, under our article NUMBERS Planetary, we have called the *indirect method* of calculation, by which he soon ascertained numbers suitable for his wheelwork. He found it convenient, however, to adopt the annual train of Ferguson, which, at that time, he thought sufficiently accurate; this train he transmuted into

$$\frac{14}{300} \times \frac{14}{46} \times \frac{16}{83} = 365^d 5^h 48^m 58^s.$$

The large wheel of 300 formed the plate that was graduated on its plane into a quadruple spiral of days, an ecliptic circle, and a declination circle, and was supported by claw feet, but not at its centre. The axis of pinion 16 had the arbor for the diurnal handle, and was carried along with the rest of the train on bridges, under an oblong box that moved round the sun in a year, and that contained the wheels of the moon and of the earth's parallelism at the remote end, and the wheels of Venus near the centre; to the under face of the annual box was made fast a large wheel of 120, which drove the trains of Mercury and the Sun, supported by bridges under the large plate; the motions were taken by pinions above the plate, having their arbors passing down through it till they rested on the cocks beneath; the last wheel of Mercury had a long tube which penetrated the sun's stem and carried an arm at the top, which, by its mechanism, shewed both the equation of the centre, the variation of distance, and the heliocentric latitude, as seen in fig. 3. Plate IV. of *Planetary Machines*, and explained under the article EQUATION Mechanism. The arbor of the sun's last wheel passed again

through Mercury's tube, and gave the proper motion to his inclined axis by the medium of three similar pinions, one on the said arbor, one on the sun's bearing piece, and one on his axis. As we have not given a drawing of this orrery, we shall not enter into a minute detail of the position of the different wheels and other parts, but subjoin a table of the trains and their corresponding values, which will give the reader a competent idea of its powers when carrying a three-inch globe with its furniture at $7\frac{1}{2}$ inches from the sun, and the other planets at proportional distances, while Venus also moved in her inclined orbit by means of her arm having a joint at the sun's stem, and resting on an inclined graduated circle.

TABLE of the Trains &c.

		D. H. M. S.
The Earth's wheels	$\frac{14}{300} \times \frac{14}{46} \times \frac{16}{83}$	365 5 48 58
Its parallelism ditto	$\frac{120}{100} \times \frac{100}{120} = \frac{1}{1}$, or one revolution.	
Moon's synodic do.	$\frac{14}{300} \times \frac{90}{21} \times \frac{38}{94}$	29 12 43 31
Moon's anomal. do.	$\frac{28}{30}$ of a lunation	27 13 28 37
Moon's nodes	$\frac{20}{102} \times \frac{121}{25}$	18 224 18 21 28
Trop. rev. of Venus	$1 + \frac{63}{97} \times \frac{40}{40} \times \frac{96}{39}$	224 16 42 7
Do. of Mercury	$\frac{15}{120} \times \frac{79}{41}$	87 23 16 44
Sun's rotation	$\frac{30}{120} \times \frac{27}{97}$	25 9 59 32

Three pinions of 15 for the earth's axis.

Three pinions of 8 for the sun's axis.

$$\text{Mercury's excentric motion } \frac{8}{25} \times \frac{25}{8} = \frac{1}{1} \text{ revol.}$$

Three pinions of 30 for the moon's phases.

These wheels were all put in motion by a common watch movement, by means of a pinion of 8 inferted on the fusee arbor, and driving a ratchet-wheel of 48 on the diurnal arbor, which, by means of the ratchet, turned without affecting the going of the watch during the time of lecturing. This was the small orrery mentioned in Dr. Thomas Young's lectures, as being the most accurate of any he had examined, and certainly is more accurate than any that preceded it. Its rectifications and use will be understood from what will hereafter be said, when other instruments have been described, which appear to merit a more particular description by the aid of drawings.

The Orrery invented by Jos. Priestley, esq. of Bradford in Yorkshire.—Mr. Priestley, a relative of Dr. Priestley, contrived and superintended the construction of an orrery in the year 1801, for Dr. Birbeck, who succeeded the late Dr. Garnett in the professorship at Anderson's university, in Glasgow, which orrery was made by Thomas Lister, an industrious clockmaker of Halifax, in the same county.

As we have been favoured with a description of this instrument by the ingenious inventor, and also with a sketch of the covering plates by the workman himself; we shall have little more to do in the account than to copy this description, to examine the calculations adopted by the contriver,

contriver, and to make such observations as have occurred in the examination.

The wheelwork, according to Mr. Priestley, is contained in a round box of brass, thirty inches in diameter, and about four inches in depth; having the figures, representing the signs of the zodiac, painted in enamel upon the side. The planets move in orbits at the exact proportional distances from the sun, the mean distance of the earth being five inches, each orbit having its proper eccentricity and inclination; and the periodic times, as well as the inequality of motion in each revolution, are nearly such as are found by the latest observations.

The covering plates, which are painted blue, have narrow openings between them, through which pass the stems which carry the planets: these openings represent the orbits; and their inclination to the ecliptic is produced by ledges raised round the openings. Adjoining these ledges are divided circles, on which the latitude, the nodes, and the apses, are marked. The ball representing the planet is fixed to a socket, which fits the stem, and resting on the ledges, rises and falls as the planet approaches or recedes from the north pole of the ecliptic.

The large gilt ball, representing the sun, moves round its axis, according to our author, in $25^d\ 15^h\ 16^m$, and the axis itself has the proper inclination and position given to it.

The orbits of Jupiter and Saturn extending beyond the circumference of the box, arms are necessarily used for these two planets. There are two separate arms for Jupiter; one of which has wheelwork, that accurately exhibits his diurnal revolution, and the motions of his satellites in their respective orbits. Either arm may be put upon the two strong wires that rise out of the box, and move in an orbit left between the covering plates, concentric with Jupiter's, on the outside of the orbit of Mars. When that arm, which shews the motions of the satellites, &c. is used, a bevel pinion is put on a square axis passing from the wheelwork in the box, between the two strong wires above-mentioned; this pinion acts in another, attached to a spindle passing through the hollow arm, and communicates motion to the train under the body of Jupiter.

The arm of Saturn, being very long, is supported by a stay, carrying a bar with two friction-wheels; which roll along the bottom moulding of the box. This arm, where it approaches the box, separates into two branches, and is fixed to two studs, that rise above the covering plates. These studs are carried round along with a narrow rim, adjoining to the ecliptic and other circles described on the margin of the top of the box. This rim, not being in the plane of the box, occasions the arm to rise and fall during a revolution, causing the ball, representing Saturn, to describe an orbit, having a proper inclination to the plane of the ecliptic.

The stem supporting the ball and ring of Saturn issues out of a small circular plate, divided into the signs and degrees of the ecliptic, and moveable on its centre at the extremity of the arm; this centre being perpendicularly under that of the ball. On this stem the satellites are moveable by the hand, and it has the proper inclination with respect to the plane of the ecliptic. By placing over the arm the same sign and degree of this small ecliptic that Saturn then occupies, the planes of the ring and of the orbits of the satellites will obtain their true positions.

The heliocentric places of the planets are shewn on an ecliptic circle, drawn on the outermost fixed rim of the top of the box: the year is pointed out by an index fixed to the arm of Saturn, and the day of the month is shewn on

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a circle adjoining to the earth's orbit. The proportional magnitudes of the planets, but not of the sun, are nearly shewn in this orrery.

The Georgian planet and his system of moons compose a separate instrument, to be put on any convenient stand, and placed at the due distance from the sun in the orrery. The centre of his orbit is at 4.54 inches from that of the sun, in a line with $11^s\ 17^o\ 22'$. At this point a small pin may be screwed into the covering plates, and a string, 96 inches long, stretched from them to meet another string proceeding from the point under the sun's centre, laid over the degree of the planet's heliocentric longitude, will give his true situation. The longitude is shewn on a silvered plate under this separate system for several years to come; and this plate, by means of the ecliptic circle engraved upon it, serves also to place the axis of the planet, and the plane of the orbits of his moons, in the right situation in the manner above described for Saturn.

The unequal motion of the planets in the different parts of their orbits has been attempted to be shewn; and the velocities in this orrery will be found to agree, nearly, with the Keplerian law of equal areas, described in equal times. Two methods have been employed for this purpose; for the inferior planets and Mars, that which is described as "*Mr. Joseph Priestley's Contrivance*," under EQUATION, is employed; but the earth, having a system of wheelwork to carry along with it, would not conveniently admit of the same contrivance; and Jupiter and Saturn being placed on arms, which extend beyond the box of the orrery, the same method could not be adopted for those planets. In these three instances, the variation of motion in question is obtained by an inequality among the teeth of the wheels, which carry these bodies round the sun, the proper method of dividing or cutting which is described in the article already referred to.

With respect to the phenomena arising out of the motions of the earth, &c. the machinery admits of four changes; *viz.*

1. In shewing the general appearances of the solar system, a small ivory ball, proportioned to the size of the other planets, and a bead representing the moon, are used: in this case the parallelism of the earth's axis and the moon's motion round the earth are shewn; but not the earth's diurnal motion.

2. The ball and bead above-mentioned being removed, an apparatus is put on in their place for shewing the apparent, such as the direct, retrograde, and stationary, motions of the primary planets; and the geocentric place of any planet is shewn by an index on a small ecliptic circle under the earth.

3. This apparatus is changed for a small circular plate, the centre of which occupies the place of the earth, and its rim is divided into the points of the compass. This plate, which is intended to represent the rational horizon of the place, can be fixed to the inclination proper for the latitude of the spectator's situation, and its meridian line being brought to pass through the sun, and the hour index being set to 0 hours, the orrery is rectified for shewing, in the most natural manner, the phenomena and corresponding times of the rising, southing, and setting of the sun and planets. By turning the winch slowly, and keeping the eye in the plane of the horizon circle, the planets will appear to ascend above and descend below that circle exactly as they would do in nature, at the time for which the orrery is rectified. A thread fixed to the centre of this horizon, and stretched to any of the planets, will shew its bearing and

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the angle made by the thread and horizon, or angle of altitude, for the time pointed out by the hour index.

4. Lastly, to the proper stems which rise from the wheelwork within the box, are adapted a small terrestrial globe, and a ball representing the moon: the globe has the annual and diurnal motions, and that by which the parallelism of its axis is maintained: the moon moves round the earth in an orbit properly inclined; having the retrograde motion of the nodes, and a motion on its axis to shew the phases. Behind the globe representing the earth is placed a small stem, carrying a circle of illumination to divide the enlightened from the other hemisphere. This part of the apparatus, though sufficiently large to shew the general phenomena respecting the moon, the vicissitudes of the seasons, and the different lengths of the successive days and nights, does not interfere with the motions of the planets.

The wheelwork is so contrived, that one turn of the handle answers to 24 hours of mean solar time; when a quicker motion is required a change can be instantly made, so that one turn is equivalent to ten days: this latter motion will be found more convenient when the relative velocities of the planets round the sun, the inequality of the motion of a planet in the different parts of its orbit, and the apparent motions as seen from the earth, or other place in the system, are exhibited as objects of peculiar attention. When the planets are truly placed in their orbits for any given time, the wheelwork will preserve, sufficiently near, for many years past or to come, their proper situations.

To shew the time of the rising, southing, and setting of the heavenly bodies, a small hour circle, with an index, is placed near the earth, and carried with it round the sun.

This orrery was constructed with the design of its being placed on a stand, which would admit of its being inclined towards, or turned back from the audience, and at the same time of being moveable on an axis round its centre, so as to bring any part of the ecliptic in front. When the face of the orrery is inclined towards the company, the position, excentricity, &c. of the orbits, and the motions and magnitudes of the planets, are more conspicuous; and the motion

on the axis is useful for bringing the instrument into the most favourable point of view, during the description of any particular phenomena; and when the planes of the orbits are turned out of a horizontal position, the handle may be inserted into a hole made beneath the box, in which situation the lecturer's assistant may conveniently turn the handle, whilst the lecturer is describing the effects produced by the particular portions of the mechanism.

To demonstrate in the most natural manner the phenomena of the apparent places, motions, &c. of the planets, as seen from the earth, provision is made among the wheelwork, for carrying a large radial rim, the centre of which coincides with that of the earth, during the revolution of the latter round the sun; on the inside of this rim is drawn, or intended to be drawn, the ecliptic with the constellations, or principal stars thereof that lie within 10° on each side of it. The apparatus for shewing the apparent motions of the planets, above described, is to be used along with this rim; when the wire passing through the centres of the earth and planets will shew, by means of a small bead affixed to its extremity, the apparent place, and motion of the object among the stars of the zodiac, exactly as they would appear at the time to the eye of a spectator, viewing the same in the heavens from the surface of our globe.

The wheelwork consists of the following trains; viz.

From the handle $\frac{55}{9} \times \frac{72}{10} \times \frac{83}{10} = 365.2$, that is, one turn *per* day very nearly; or by moving a slide the portion $\frac{55}{9}$ is discharged, and the train becomes $\frac{72}{10} \times \frac{83}{10} = 36.52$ turns in a year, or one turn in ten days very nearly.

The large wheel of 83 teeth revolves once in a year, and gives motion to the several wheels and pinions placed round it, which produce the periodical revolutions of the planets, as under; viz.

					D.	H.	M.	S.
Sun	-	$\frac{9}{83} \times \frac{13}{18} = 12.76923$	{ rotations <i>per annum</i> , or one, } as it respects the Earth, in }		28	14	28	30
Mercury	-	$\frac{8}{83} \times \frac{40}{16} = \frac{320}{1328}$, or $\frac{20}{83}$	of 365. ^d 24	-	88	0	13	52
Venus	-	$\frac{12}{83} \times \frac{102}{24} = \frac{1224}{1992}$, or $\frac{51}{83}$	of ditto	-	224	10	11	23
Mars	-	$\frac{12}{83} \times \frac{156}{12} = \frac{1876}{996}$, or $\frac{156}{83}$	of ditto	-	686	11	24	15
Jupiter	-	$\frac{48}{83} \times \frac{164}{8} = \frac{7874}{664}$, or $\frac{984}{83}$	of ditto	-	4330	1	46	52
Saturn	-	$\frac{88}{83} \times \frac{222}{8} = \frac{19536}{664}$, or $\frac{2442}{83}$	of ditto	-	10745	23	25	57
Diurnal Motion		$\frac{10}{397} \times \frac{10}{46} \times \frac{12}{24} = 365.24$, or		-	365	5	45	36
Parallelism	-	$\frac{19}{235} \times \frac{47}{19} \times \frac{30}{6} = \frac{26790}{26790} = 1$ year, or		-	365	5	45	36
Lunation	-	$\frac{19}{235}$ of 365.24	-	-	29	1	43	15.6
Moon's Nodes		$\frac{56}{59}$ (estimated thus $\frac{56}{3}$) = 18 $\frac{1}{3}$ years		-	6817	20	48	48

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In this analysis of the wheelwork and their powers, it is to be understood that the 83 is the same wheel in each train, and that the large wheel of 397, in the train of the diurnal motion, is fixed immoveably, but gives motion to the first pinion 10, which is carried round it by the annual motion: the last pinion 12 of this train has an axis which passes through the other sockets, and communicates, by means of three small equal wheels, a proper motion to the earth's axis.

The inventor says that the diurnal motion of the earth, and the motions of Jupiter's satellites, were not originally intended to make a part of this machinery; that is, it was intended to be simply a planetarium, but it was afterwards converted into an orrery. We entertained our doubts whether in this construction of the train, that regulates the daily motion, the earth's motion on its axis would be uniformly steady, but in a second communication from the author we learnt, that "by accurately proportioning the sizes of the wheels and pinions, and using high numbers in this train, the small globe is made to revolve with regularity, and without any inconvenient friction or stress on the teeth." For the moon's phases there is, moreover, a succession of three equal wheels, the first made fast to a central socket in the usual way.

For the motions of Jupiter and his moons the following machinery is used. On the lower end of the square axis, (passing from the wheelwork in the box between two short wires,) standing perpendicular to, and carried round with the wheel that produces Jupiter's revolution, is put a pinion of 10, which is driven against the 183 teeth cut in the inside of the rim-like wheel, having 216 teeth on its outside, which 216 teeth are adapted to the wheel of 72 teeth in the train of the handle. By these means the said square axis will move round

by the train $\frac{55}{9} \times \frac{72}{10} \times \frac{216}{72} \times \frac{10}{183} = \frac{55}{9} \times \frac{216}{183} = \frac{55}{1} \times \frac{24}{183}$
 $= 7 \frac{39}{183}$, or 7.21918 days coming directly from the handle;

but the pinion of 10 teeth is carried by Jupiter's arm $\frac{183}{10}$

or 18.3 revolutions backward in each period of Jupiter, each of which is equal to 7.21918 days; therefore, the whole drawback is $7.21918 \times 18.3 = 132.114$ days; hence we must say, as $4330.0741 : 132.114 :: 7.21911 : 0.22026$; this quantity taken from 7.21918 leaves 6.99892 for the true period of the arbor of pinion 10 to revolve in, as the first mover of the four pair of wheels and pinions for Jupiter's satellites. The motion of the arbor of the pinion 10 is trans-

mitted to the common arbor of the drivers by the train $\frac{9}{66} \times \frac{88}{12} = \frac{792}{792}$, or unity; therefore the common vertical arbor

turns in the same time as the one at the interior end, and the pinions of transmission are put at the opposite ends of a long arbor passing through the middle of Jupiter's tubed arm, and act with each a contrate wheel of the numbers above stated.

The wheelwork of the four satellites of Jupiter, as well as of his diurnal motion, are these, with their annexed values, viz.

		D.	H.	M.	S.
Jupiter's wheels	$\frac{7}{118}$ of 6.99892	0	9	57	52
1. Satellite	$\frac{21}{87}$ of ditto	1	16	32	43

		D.	H.	M.	S.
2. Ditto	$\frac{33}{65}$ of 6.99892	3	13	16	44
3. Ditto	$\frac{85}{83}$ of ditto	7	4	1	17
4. Ditto	$\frac{79}{33}$ of ditto	16	18	7	11

Of these numbers it may be observed that they are not so accurate as Roemer's, which take their motions from a period of seven days, which is very nearly also the period of the common arbor in this instrument that contains the drivers.

The new Orrery for equated Motions in three Parts, by the Rev. W. Pearson.—After the planetarium, constructed at the Royal Institution, had been finished under Mr. Pearson's superintendence, he calculated numbers proper for a tellurian and lunarium to be combined into one instrument, as a necessary accompaniment, with a view to have it constructed for the use of the institution; but circumstances prevented such measure being put in execution, or even being proposed to the managers. In the year 1805, however, the plan was put into the hands of Fidler, who completed the instrument in a very perfect manner for the inventor himself. In the following year the same gentleman added both the planetarium portion, and the satellite portion, to be successively applied to the same inlaid mahogany stand, which three portions, accurately made, and separately applied, constitute an orrery the most perfect, perhaps, in its operations, of all the machines that have hitherto been invented in any country. As the PLANETARIUM and SATELLITE portions of this superb orrery form separate instruments individually, we shall, agreeably to our proposed plan, defer the description of both these till we arrive at the articles themselves, under their appropriate titles; and shall confine ourselves in this place to a detail of the parts that constitute the first portion, or tellurian and lunarium united; which portion may, according to our definition, be considered in itself as the most essential feature of the orrery: but in the mean time, it may be proper to mention, that the motions of the primary planets, in the planetarium or second portion, move in eccentric orbits with their variable distances and velocities, making equal areas in equal times in their exact periodical times; and that the third portion, containing the system of Jupiter and his moons, together with the proper motion of the earth, produces the periodic times with a degree of accuracy never before accomplished by mechanical means. The three portions are applied, or may be applied, in succession, to the same ornamental stand, as the subject may demand, or they may have each a separate stand.

An instrument capable of representing with extreme accuracy, and on a large scale, all the motions of the earth and the moon at the same time, had long been a desideratum in the philosophical world. For while the attention of the mathematical instrument-maker was occupied by studying portability and neatness in constructing the tellurian and lunarium, as detached portions, to be applied successively to the same stand, the utility of the instrument, so discontinued, became circumscribed; inasmuch, as all the phenomena, which depend upon the motions of the earth and moon, taken conjointly, are inexplicable by it. It must be allowed, indeed, that from observing the modern tellurian in motion, a spectator might form a competent idea of the natural succession of the seasons, and of day and night; likewise, by attending to the lunarium he might see the cause of eclipses and lunar aspects explained; but, as to

the *time when*, and the *places* on the globe *where* any eclipse will be visible; and also as to the solution of all the numerous variety of problems which have a reference to *time* and *place*, the modern instruments on sale leave us entirely to the wide field of conjecture. The tellurian and lunarium, as heretofore constructed, not only explain by *halves*, effects, which the *mind* must afterwards combine, but have their wheelwork so imperfectly calculated and arranged, that even those partial representations, which they profess to exhibit, are very inaccurate: for instance, all the tellurians, which we have had occasion to examine, in the different shops of London, make the solar year to consist of an *entire day* too much, or else too little; to say nothing of the fractional portion of a day, which some of them omit to take into the calculation, notwithstanding a supplementary day ought to be provided for in every leap year.

These, and other inaccuracies, both in the lunar motions, and in the earth's annual course, (by the latter of which the summer and winter half-years are improperly made to consist of an equal number of days,) pointed out the necessity of having a new instrument constructed, which might correct the errors, and supply the defects of the very imperfect ones, which had heretofore been used in seminaries and public lecture-rooms.

The instrument, which we here offer to the public notice, is, we understand, the result of much contrivance, and of great labour in ascertaining, by numerous calculations, the most accurate possible numbers for its wheelwork. The hours which had been spent, in analysing the various instruments which were made during the last century, produced a conviction; that though much had been attempted and professed to be done by different men on the present subject; yet no real improvement, since the days of Huygens, had actually been effected in instruments for explaining celestial phenomena; unless, indeed, the scenic effect produced by the Eidouranion be considered as an improvement. Astronomers without mechanical skill, and artists without sufficient science, alike laboured under difficulties, in the contrivance and execution of such an instrument; as may be deemed perfect of its kind; and how far the pretensions of the contriver of this machine for uniting the two requisite qualifications may be well founded, will best be proved by an examination of the instrument itself.

Plate V. of *Planetary Machines* represents a perspective view of the first portion of the orrery on a reduced scale, as seen when put together.

A B is a circular table or stand of mahogany two and a half feet in diameter, to which is fastened immoveably the large contrate wheel of 269 teeth. C D is a bar of brass, which revolves round the centre piece of cylindrical brass E upon a shoulder, and rests also near the extremity of the table on the brass friction-wheel above A, and is called the *annual bar*, by reason of its being carried once round in a year; at the remote end of this bar, beyond C, is fixed the annual index, that points out in a quadruple spiral, drawn on a brass rim on the surface of the table, the days of the month in the first, second, third, or fourth spiral line, accordingly as the year may be leap year, or the first, second, &c. after; and also indicates the sun's place in the ecliptic and his declination in two interior circles, as well as his mean anomaly and corresponding equation of the centre; all which graduations are engraved along with the signs of the ecliptic. The small contrate wheel of 62, which appears in an inverted position above E, is also fixed fast to the central brass piece; but all the other parts of the mechanism are carried by the annual bar, either above it, or below it; and the wheels borne by it are put into motion, as it goes round,

partly by means of the pinion of 10, hidden with the long arbor under the annual bar, being connected with the fixed wheel of 269, and partly by the pinion of 8 on the long arbor above it, being acted upon by the immoveable wheel of 62.

The train of wheels, which carries the annual bar round, and also gives the daily motion to the earth, is composed of the exact ratio between a day and a solar year, and consists

of the following numbers, viz. $\frac{10}{269} \times \frac{10}{26} \times \frac{18}{94} = \frac{1800}{657436}$

which ratio inverted is equal to $365^d 5^h 48^m 48^s$.

This train is agreeable to Lalande's determination of the solar year *exactly*, there being not an error of so much as even the fractional portion of a second in a year: hence, when the machine has been made to revolve for the space of a million years, it will require no rectification of this train, it being as accurate as the tables themselves, whence the sun's place is taken from the Nautical Almanac. The manner in which the foregoing train is arranged, to produce its effect, is thus; the large wheel of 269, which is immoveably fixed to the table, gives motion to the first pinion of 10, which is concealed on the interior end of the long horizontal steel arbor placed under, and parallel to the annual bar, whilst this bar moves forwards; then the contrate wheel of 26 being fast upon the same arbor, which is lowered from its place above A to be seen, revolves in the same time, and actuates the second pinion of 10, placed on the first perpendicular arbor, and supported by a cock F beneath the annual bar, on which perpendicular arbor is also fixed the wheel of 94 above the annual bar and under the bridge G, into which the upper end of this arbor is pivoted. Lastly, the wheel of 94 drives the small wheel of 18 (not seen) round in an exact day; which last wheel is soldered to the lower extremity of a long tube almost six inches long, that bears also the small wheel of 40 on its superior end, for the purpose of communicating motion to a similar wheel, placed on the earth's axis, by the help of an intermediate wheel; which three wheels have similar numbers of teeth and dimensions; the long tube is supported by, and revolves upon, a long polished piece of steel, screwed home into the annual bar, and kept fast to its place by a tapped nut below the bar, which perpendicular piece of steel, or stem, is turned in a lathe in such a way that the two extremities of the revolving tube move freely upon it without shake, but with as little friction as possible, for which purposes the whole length of the stem is a little diminished in diameter, except at the two ends, on which the extremities of the tube revolve. By this portion of the mechanism the *exact* proportion is preserved between a solar day and a solar or tropical year.

The next portion is that part of the mechanism by which the earth's axis is preserved parallel to itself in every part of its annual orbit; this consists of two contrate wheels of similar dimensions, each containing 62 teeth, one placed with the teeth downwards fast to the central stem above E, and the other revolving above the bridge G with its teeth uppermost, that its motion may be in a retrograde direction, and round a long tube made fast to the bridge, which is interposed between the tube of wheel 18, and the tube on which the wheel 62 is fastened, so that the fixed intermediate tube of the bridge keeps the other two tubes from touching one another, and serves as a stem for that of wheel 62. The motion is communicated, from the fixed to the revolving wheel, by means of two similar pinions of 8, which may be of any number of teeth, placed at opposite ends of the long horizontal steel arbor, which revolves parallel to and above the annual bar, by means of the connection that the interior pinion

pinion has with the fixed wheel, while the annual bar is in motion: the horizontal arbor is pivoted into the bridge H at one end, and into a cock K at the other. On the superior end of this third tube, or tube of 62, is placed, in an adjustable manner, the circular rim I, of nine inches diameter, on which an ecliptic circle is engraven, (and on which a circle of declination might be engraven also, instead of that on the table); to this rim is attached, by screws, the bearing piece L, which supports a terrestrial globe of nine inches diameter, fitted up with a quadrant, and moveable meridian and horizon circles to be adapted to any longitude and latitude. Again, by means of the retrograde motion of the ecliptic circle I of one revolution, for every direct revolution of the annual bar, the axis of the earth is made to point always to the same individual distant point in every part of its annual orbit; or, in other words, it preserves its parallelism perpetually; on which circumstance, together with the inclination of the axis, the vicissitude of the seasons depends.

Now, whilst the little ecliptic circle revolves backwards once in a year, it carries the earth along with it, and therefore presents every part of the globe successively to the sun's rays, by which operation, provided the earth had no rotation on its axis, one night and one day only would be the lot of its inhabitants in every year, and the sun would appear to rise in the west, and set in the east, which phenomenon would really take place in nature, if the earth's motion on its axis were stayed, (of which circumstance, we believe, astronomers have taken no notice.) To this phenomenon, however, it is owing, that an exact rotation of the earth, as it regards a fixed point in the heavens, constitutes not a solar, but a sidereal day, the duration of which is only $23^d\ 56^m\ 3.43$ solar time, the difference between which and a solar day amounts to an entire day in every solar year; hence in every 365,242 natural days, the earth makes 366,242 rotations on its axis, which would be so many natural days, if the parallelism of the earth's axis were not preserved, which parallelism effects a deduction of one day in a solar year, in the way that has been described: The question then arises, how the additional rotation is given to the earth's axis by the mechanism before us? The effect is this; viz. while the central wheel of 40, under the end of the antarctic circle, revolves 365,242 times, the piece L, carried by the small ecliptic plate, carries the next wheel of 40, or intermediate wheel, round the central wheel in a retrograde direction, while their teeth are in action, which circuit would give the intermediate wheel just one revolution, provided the central wheel had no motion at all; but the intermediate wheel receives by communication 365,242 revolutions from the central wheel, independently of the additional one in consequence of the circuit; therefore, the total number of revolutions which it makes in a retrograde direction are 366,242, which it communicates to the third wheel of 40 placed on the earth's axis, without either addition or diminution; consequently, the earth makes exactly 366,242 rotations in 365,242 natural days. It is to a want of attention to this circumstance, that must be attributed the inaccuracy of our modern tellurians, for either an addition or subtraction, occasioned by a compound motion derived from the annual circuit, has rendered them useless as to all the purposes connected with particular deductions. By this construction of the instrument, both solar and sidereal time are indicated on the same dial-plate M, placed on the top of the tube that revolves in twenty-four hours, by means of the two hands O and P, the former of which is placed on a fixed stem of steel, round which the tube revolves, and the latter, P, is carried in a retrograde direction by the ecliptic circle once round in every year, so as to meet any particular

hour on the horary plate $3^m\ 56.57$ sooner than it did on the preceding day; so that, if the two hands be put to the same hour on the day on which the sun enters Aries, the space on the horary plate contained between the two hands, on any day in the year, will be the difference between solar and sidereal time, or, what is the same thing, the sun's mean right ascension for that day converted into time. In all problems relating to solar time, the hand O must be consulted. N is a circular brass plate, supported by the upper end of the tube which belongs to the bridge H, and has the days of the moon's age engraven on it, together with the times of her meridian passage, and the equations of the tides on each day of her age, according to her distance from the apogee. Q is the terminator for the circle of illumination, adjustable to any height; and at right angles to this terminator, a lens, R, is suspended to produce a solar ray on the surface of the globe, adjusted to the height of the centre of the earth, which points out where the sun is vertical on any given day, as also the variation of declination, and a variety of other phenomena in a very striking manner.

Another essential requisite peculiar to this instrument is, that it makes summer as it is in nature, nearly eight days longer (from the vernal to the autumnal equinox), than winter (from the autumnal to the vernal.) This is effected, without any additional mechanism, by the cutting of the teeth of the large contrate wheel of 269, in such a manner, that there is a gradual increase in the size of each successive tooth through one semicircle, and a corresponding decrease in those of the other, so that there are $5\frac{1}{4}$ ths more teeth in one semicircle of the wheel than in the other, and consequently a proportionate number of days motion of the earth, counted on the solar dial-plate, during its continuance in the aphelion or summer semicircle of its orbit; than in its perihelion or winter semicircle of its orbit. See EQUATION.

Again, as the cause of the variation of the seasons is generally explained separately from the cause of alternate days and nights, a contrivance is requisite to detach the diurnal from the annual motion of the earth, for otherwise the slowness of the annual motion would be unfavourable to an explanation of the phenomena which depend upon the parallelism only; for this reason the first pinion 10, on the horizontal arbor under the annual bar, which is pivoted into the concealed cock and under the arm, over the teeth of wheel 269, is capable of being detached at pleasure from the large wheel, by turning the tapped and milled nut S above the annual bar, which draws up the squared bearing piece of the cock, into a square socket fastened to the annual bar, and along with it the end of the arbor, sufficiently high for the pinion to clear the wheel; by which elevation all the motions which depend upon the great wheel of 269 are allowed to stop.

Having now detailed the particulars of the tellurian portion of the instrument, the lunarian portion demands our attention. Let it, however, be premised, that to constitute a perfect instrument, the motions of all the different parts of the mechanism, however accurately calculated, ingeniously arranged, and exactly proportioned, with a view both to comparative dimensions and strength, must commence as nearly as possible at the same time; otherwise the indications on the different graduated faces and circles will not exactly correspond with one another: for instance, we have seen the moon, in some instruments of great value, or rather we should say of great price, not commencing its motion round the earth, on turning the handle, until the earth has made upwards of a complete rotation on its axis. Such effect was therefore to be guarded against, by taking the communication of motion for the moon, not from a slowly moving annual

nual wheel, as is usually done, but from the same wheel from which the earth derives its motion, which first moving wheel ought to be nearly equally distant from all the last moving wheels in the instrument, in order that the resulting incipient motions may be *contemporary*; to effect this desirable purpose, the wheel of 94, belonging to the earth's train, is cut both at the edge, and also as a contrate wheel, to be driven by the unseen wheel of 18, placed on the arbor of the handle T, and revolving in 24 hours, for the same reason that the other wheel of 18 on the long tube revolves in this time; by this situation of the handle, all the different trains are coupled together, and begin to move at the same instant; and what appears to be moreover an advantage, the lecturer may very conveniently turn the handle for himself, whilst he accompanies the earth in its annual circuit, and reads the divisions on the different faces. The horary circle, U, contains also the seven days of the week, indicated by a

second hand revolving in $\frac{18}{18} \times \frac{56}{8}$ of a day, which is an exact week.

The train of wheels for producing the moon's synodic revolution, or monthly motion, being connected alike with the annual and diurnal ends of the earth's train, on account of having its motion communicated from the middle of the earth's train, may be differently denominated, and may have its value ascertained, either as the improper fraction of a day, or as the proper fraction of a year, it being so peculiarly circumstanced, for the sake of gaining *immediate* motion, as to take in either half of the earth's train, as a constituent portion of its own, whereby there becomes a saving in the number of wheels, without a diminution of accuracy in the value of the train: for if we begin to calculate from the large wheel of 269, and consider it as constituting the first

wheel of the lunar train, we shall have $\frac{10}{269} \times \frac{43}{13} \times \frac{48}{73}$ of $365^d.242z = 29^d 12^h 44^m 3^s.28765$; but if we begin at

the earth's axis with the wheel of 18, we shall have $\frac{24}{18} \times$

$\frac{26}{10} \times \frac{43}{13} \times \frac{48}{73}$ of a day = $29^d 12^h 44^m 3^s.28765$, as be-

fore, four extra wheels being all that we have occasion to introduce, in addition to the earth's train, to effect a degree of accuracy in the synodic revolution, which far exceeds any thing that has been done before, in this or any other country, with the same number of wheels; the error being little more than a quarter of a second in an entire month.

The arrangement is thus: on the long arbor under the annual bar, and nearly at the remote end, is fixed a driving pinion or small wheel of 13 to actuate the contrate wheel of 43 resting on the cock V, shewn a little below its true place, on the perpendicular arbor of which wheel is also pinned fast the wheel under the cock W, of 73, which wheel drives the tubed wheel of 48 round in the time already specified; the tube of the wheel of 48 revolves round the fixed tube of the bridge H, and sustains on its upper end the brass bar X X, which carries the moon round the earth, and supports the mechanism belonging to her: this monthly bar may be adjusted to any situation by the clamping piece seen near the handle T. The moon's latitude is not regulated by an inclined plate, commonly called the nodes' plate, which, for a globe of nine inches diameter, would have been too large and heavy for the wheelwork; but by a forked lever of steel, on which the moon's stem rests, that is raised and lowered alternately during the period with respect to the nodes; this motion is derived from the lunation thus;

a lunation is to an anomalistic revolution of the moon, as 777 are to 716, very nearly, which numbers are capable of

forming the train $\frac{16}{74} \times \frac{179}{42}$ of a lunation, which will be

a period of $27^d 5^h 5^m 36^s.9$, in which the error is + 1."3 only. The action of this train is thus; the wheel 74 is fixed fast on the tube of bridge H, and has therefore no motion, while the monthly arm, X X, is carried round it; the pinion 16 lies on the upper face of this arm, inserted fast on the upper pivot of a vertical arbor, the lower end of which rests on the two-fold cock, seen above U, but which, together with the said pinion, is nearly concealed by plate N lying over them; on the under side of the monthly arm, and on the same vertical arbor, completely concealed, is the small wheel 42 driving the contrate wheel 179, on the horizontal arbor, that lies parallel to, and under the arm: the rim of this contrate wheel is wide enough to admit of the divisions for shewing the moon's latitude, by the edge of the arm used as an index, and its posterior face has an excentric plate, resembling a circle flattened on one side, and surrounded by an edge-bar of the same shape, which edge-bar taking the fork of the steel lever Y, gives it the alternate motion which raises and lowers the moon's stem. A screw in the cock Z, under the arm, presses against the horizontal arbor of wheel 179, and allows its teeth to come out of action when screwed back, so that the graduated rim may be brought to adjustment for latitude, in any situation of the arm, and screwing in puts the teeth again into action. The moon's argument of latitude, or distance from the node, is also marked on the rim of 179; and the fulcrum of the lever is at one-third of its length from the forked end, in the cock Z.

Lastly, the mechanism for the moon's anomalistic revolution, or the time in which she performs all her variations of distance from the earth, and on which her grand equation depends, remains yet to be explained. By a peculiarity in the construction of this instrument, there is not an anomalistic plate, deriving its motion from an annual wheel, and indicating when the moon *ought* to approach to and recede from the earth, as is usual in instruments where the anomalistic mechanism is introduced; but the *moon herself* actually moves in an *excentric orbit*, in the proper anomalistic period, and at the same time preserves the due inclination of her orbit, which two requisites have perhaps never before been combined by any mechanical contrivance.

The motion is derived from the synodic revolution thus; a wheel of 64 is fixed fast on the top of the tube of bridge H, round which the moon's arm revolves, whilst the wheel of 67 has a connection with the teeth of 64; the consequence is, that the wheel of 67 is made to revolve, and with it the wheel of 46, which is attached to it; this last wheel ought to drive the wheel of 41, which is the last in the train, and which carries the moon alternately nearer to and farther from the earth, by means of a cranked stem, but they are necessarily too distant to act together, where the earth is on so large a scale as nine inches, the communication is therefore made by an horizontal arbor, which has a pinion at each end of similar numbers, which construction requires the wheels 46 and 41 to be both of them contrate; the effective train, therefore, is

$\frac{67}{64} \times \frac{41}{46} = \frac{2747}{2944}$ of 29.5306

days, or the lunation of the wheelwork = $27^d 13^h 18^m 32^s$, during which period the deviation from the truth amounts to only 1."9499 of time.

The stem, a, of the crank, a b c d, is square, and passes through the socket of wheel 41, which is round without and square within, and pivoted into the cock e, and lunar arm X. This

X. This stem rises and falls, as has been described, and carries the moon, resting on the crank, along with it: this alternate rising and falling of the moon in every revolution, with respect to the nodes, at the same time that she departs from or approaches to the earth, once in every anomalistic revolution, by the motion of the crank, produces an orbit as nearly as may be like the real orbit of the moon, not only with respect to shape and position, but to acceleration and retardation also; for if the bend of the crank, measured from the stem to the moon's stem, be made to bear the same proportion to the mean distance of the moon from the earth, that *twice* the excentricity of the lunar orbit does to its radius, then the crank piece, *b*, will represent the whole equation of the centre, and will be alternately additive and subtractive, as in nature. Taking *twice* the excentricity, it must be granted, will render the lunar orbit too excentric for its distance from the earth, but when it is considered that the earth and moon are constructed on a large scale, the *distances* with respect to each other, and also with respect to the sun, cannot possibly be preserved, without making the annual bar immensely long, therefore the objection on this score vanishes.

Over the cock, *e*, is fixed a circular face to indicate the moon's distances and equations dependent upon them, by the help of the revolving hand *f*, which is placed on the upper extremity of the arbor of wheel 41, and which revolves in an anomalistic revolution, without rising and falling with the stem of the crank.

The hand *i*, carried by the lunar arm, indicates the moon's age, meridian passage, tides, &c. on the fixed plate N.

From this account in detail of all the separate parts of the instrument in question, and of their application, it is presumed that any artist, accustomed to wheelwork, may, without difficulty, proceed in the construction, particularly as the order, in which the parts are described, is also the order in which they must be made and put together. The dimensions have been purposely avoided, lest a confusion should take place in the description; and that they may be more conveniently referred to, a table of them is annexed to the end of this account, for the use of the workman.

It would enlarge our account too much, to introduce in this place particular directions for dividing the circles on the various faces of the plates; and would imply, besides, a knowledge of the application of astronomical tables in the reader, in which few, comparatively speaking, are conversant. We shall, therefore, pass over the necessary directions in this place, as being worthy of a separate notice, and as requiring appropriate drawings. It falls, however, within the province of the present account to say a few words respecting the method of dividing the quadruple spiral, in such a way that each line may contain $365\frac{1}{4}$ spaces, in order to take in the 29th of February every fourth year. To effect this condition, the spiral must begin at noon of the 1st day of March, civil time, and end on the last of February; and also the day spaces must be proportioned to the velocity of the earth's motion in its annual circuit, which, we have seen, is either increasing or decreasing in every part of the circle round the sun, in consequence of the unequal teeth of the large wheel of 269. Here the skilful mathematician and the unlettered artist would probably find themselves equally at a loss how to set about a business apparently so complex. The spiral, however, being once drawn, which requires but little mathematical knowledge, (and still less practice in mechanics, provided a beam-compass be at hand,) the business is perfectly simple and easy; for the instrument *will divide its own spaces* in the best possible manner: because, as there

are 365.242 turns of the handle for one revolution of the annual bar, all that is necessary, after having adjusted a straight edge to the index end of the annual bar, is, first, to turn the handle, and then make a dividing mark on the first spiral; then another turn, and another mark, successively, until four years are gone through; care being taken to mark, by a long line, each 5, 10, 15, &c. of each month; and that the aphelion point of the large wheel, when the pinion is acting with it, be diametrically opposite to the degree in the ecliptic, where the sun's apogee is, which at present is at 91° of Cancer.

Hence the instrument itself is the best possible machine for dividing the day spaces, both for expedition and accuracy; for, besides the quickness with which the operation may be performed, if there should happen to be a large or a small tooth in the large wheel, from any cause, which tooth would accelerate or retard the annual motion, this mode of dividing will always *accommodate* the day spaces to the size of the teeth opposite them, without the intention, or even knowledge, of the person who divides; and as the same wheelwork must indicate which divided, there is the greatest probability of the day spaces completely answering their intention, which could not be so well expected from any other mode of division. An instrument made from this plan, well executed in its parts, and properly adjusted, will work the various problems, adapted for the terrestrial globe, by the mere turning of the handle, and that in the most natural way. The globe will be in reality what the new mounted globe only professes to be; and, what is of no small advantage to the learner, the *reason* will appear for drawing all the imaginary circles, which are usually drawn on the surface of the globe, and which are generally taken for granted to be necessary, without a reason being assigned. In short, the instrument will combine all the uses of the terrestrial globe, the tellurian, the lunarian, and the eclipsarian; and its operations will extend not only to explain and illustrate, but to calculate and foretell, without any limit of years to come, phenomena which require both great skill and perseverance to predict by the help of astronomical tables. Lastly, to the above-described instrument an apparatus is added, to illustrate the tides; and the sun, or, instead thereof, an Argand's lamp, with a darkening cover, and convex glass, to make the rays of light fall parallel on the globe, is placed on the annual bar, and turns round the common centre of gravity between it and the earth. Likewise, a small lamp is occasionally carried by a lever attached to the moon's stem, at the inner end of which lever a lens is adjusted, which throws a central lunar ray on the surface of the earth, as the sun's lens does the solar light; by means of which luminous points travelling over the revolving globe, not only solar and lunar eclipses, and the countries to which they are visible, may be easily explained, but the rising, setting, and culminating of either body will appear with the corresponding times on the respective graduated circles, for altitudes, azimuths, and amplitudes: in short, all the phenomena, arising out of the contemporary motions of the earth and moon, will be exhibited by this machine as they happen in nature, particularly when small pulleys, for keeping the moon's lamp pointing properly to the earth, are duly applied during the revolution of the crank.

Table of Dimensions.

	Feet.	Inches.
Diameter of the stand or table	-	2 6
Distance from the sun to the earth	-	1 8
Distance from the earth to the moon	-	0 8
From the table to the centre of the earth	-	1 0
		Diameter

ORRERY.

Diameter of the globe	- - - -	Feet. Inches.	0 9
Small ecliptic plate	- - - -		0 9
Fixed plate of moon's age	- - - -		0 10½
Bridge G long	- - - -		0 5½
Bridge H	- - - -		0 4
The dimensions of smaller parts as in the plan.			

Dimensions of the Wheelwork.

	Wheels.	Diameter to the Pitch Line in Inches.	Teeth per Inch.
Earth.	269	12	7.1
	10	0.45	7.1
	26	1.2	8
	10	0.385	8
	94	3.7	8
	18	0.71	8
Lunation.	13	0.6	7
	43	1.96	7
	73	3.33	7
	48	2.18	7
Nodes.	74	2.05	11.5
	16	0.44	11.5
	42	0.67	20
	179	2.86	20
Apogee.	64	2.05	10
	67	2.14	10
	46	1.46	10
	41	1.30	10
Dial work for handle.	18	0.71	8
	18	0.71	8
	8	0.2	15
	56	1.22	15

The pinions on the long arbors, as are also the wheels of 62, are optional.

The improved Orrery for mean Motions, contrived by the Rev. W. Pearson.—We have already said that a *grand orrery* is a machine which represents by wheelwork the motions of all the primary planets, and also of the moon and Jupiter's satellites, together with the diurnal motion, in combination with the annual motion of the earth: in fact, it unites the several properties of a tellurian lunarium, planetarium, and Jovian instrument in one machine, and is the most comprehensive piece of mechanism, for explaining the solar system, that has yet been invented, inasmuch as that it exhibits each planetary body moving in its own orbit, while the whole system is in motion together. After our author had succeeded in constructing a superb orrery, for equated motions in three parts, from the most elaborate calculations, and on a scale of magnitude that is admirably suited for explaining different portions of the system in distinct lectures, or lessons, the first of which portions we have already described; he conceived a plan of uniting all the different detached portions into one machine, on a smaller scale indeed, but retaining all the essential motions, without the equations, that he had before represented in separate portions with the equations, which combination of all the mean motions had never before been effected, even with tolerable accuracy, notwithstanding the great expense that had been incurred in the construction of

huge machines, that professed much more than they could perform, and that had brought the utility of planetary mechanism into disrepute. The orrery we are now going to describe, was not only calculated and planned by Mr. Pearson, but completely constructed by Fidler under his direction, and from his plans and sections, in the short space of two months, during the past spring (1813), and is found to answer the expectation of its contriver in its fullest extent. The outline of the plan was, to reject all unnecessary expense arising out of bulk or complexity of construction, but yet to retain all the variety of mean motions, that a full illustration of the system demands in a lecture room; hence portability, simplicity, accuracy, strength, and neatness, are the characteristic features of the machine; and considering the great variety of problems that may be solved by it in the most natural manner, by the aid of an equation table, the expense is by no means considerable. The purchase comes within the reach of every respectable master of an academy, which was the object the author had in view; and as he has himself set the example, in an establishment of the first consequence, it is presumed that a minute detail of his labours may tend to benefit the rising generation. It would have carried the inventor beyond the limits of his plan, if he had attempted to exhibit any other than *mean* motions, except in the case of the moon, whose exact place in the heavens is an object of importance in navigation, as well as in the explanation of eclipses: neither would it have been consistent with his views, to have aimed at *extreme* accuracy in all the periods, (particularly of the four newly discovered planets, which may want further correction in the lapse of a few years,) but to unite simplicity with such a degree of accuracy, that, while the motions are uniformly smooth and steady, no sensible error may arise in any of the periods for a century forwards or back: indeed, more than half the periods, particularly the most interesting, are, notwithstanding, rendered nearly as accurate as the periods collected from the astronomical tables themselves, as will be seen in the subjoined table of errors. In order to convey to the reader a clear insight into the different contrivances of this orrery, as well as to give him an idea of its external appearance, we have given two plates of it, VII. and VIII. of *Planetary Machines*; one explaining the internal structure of the acting parts in combination, as well as explicative of the parts that act out of the case; and the other representing a perspective view of its external aspect. The box A A B B, which contains the different trains of wheelwork, is cylindrical, 12 inches in diameter and three deep, supported by a pillar and three claw feet, seen in *Plate VII.*, all of brass neatly laquered; the frame C C, in *Plate VIII.*, which contains the trains, is screwed into this box, through four little pillars, two of which are seen at C and C, and may be taken out at pleasure, after the circular cover is removed, which is also kept down by screws; but the radii vectores, or arms of the planets, must first be taken off, with the appendages hereafter to be described. When the frame is taken out of the cylindrical box, and held in an horizontal position level with the eye, its section will appear as represented in the lower part of *Plate VII.*, except that some of the wheels connected with the earth's train are displayed in *figs. 2 and 3*, for the purpose of being brought into view. The wheels are laid down in their due proportions, and of half their dimensions, so that they may be copied without difficulty by any ordinary instrument-maker, who may be disposed to adopt the construction, and who, like Fidler, possesses the means of having the requisite number of teeth cut in each of the wheels. It may not be improper to mention here, that this part of the work can be done by Fayer, of Red-Lion street, Pentonville, in the best manner, by the famous

famous engine which we described, (see *CUTTING-Engine*,) as the invention of the late *Rehé*, and also that the expense of having all the wheels so cut is not very considerable. We will begin our detail at the diurnal handle near *A*, which is inserted into a hole in the side of the brass box, and takes the squared end of the horizontal arbor, which revolves in an exact solar day, and is pivoted into the double cock *H*; on the interior end of this arbor is fixed a bevel wheel of 24 teeth, driving another similar wheel of 24 fixed above it, on the superior end of the vertical arbor *F*, under the dotted cock *C*, which vertical arbor, therefore, revolves also in a solar day: on the lower end of this diurnal and vertical arbor is a pinion of 15, let down through a hole made in the plate *C C*, till the lower end of the arbor rests on a little cock seen screwed to the under side of the said plate: this plate, *C C*, carries the annual train underneath it, and the rest of the wheelwork above it; the pinion of 15, above referred to, drives the wheel 120, to which is fixed a pinion of 23, seen the lowest, and driving the wheel 61, to which wheel is again made fast, above it, the pinion 14, to drive the larger or annual wheel 241 round in a solar year, which it does

with great accuracy, the whole train $\frac{120}{15} \times \frac{61}{23} \times \frac{241}{14} = \frac{58804}{161}$, being equivalent to the period $365^d 5^h 48^m 49^s 192128$.

This train is represented as having the arbors in a straight line, in order that their connection may be seen and understood, but in reality they are placed round the centre of the box, and occupy $\frac{1}{40}$ of a circle, as may be seen in the calliper laid down in *fig. 3* of *Plate VIII.*, which we have inserted for the use of the instrument-maker, who might not otherwise understand the proper position for these wheels. The wheel of 120, under the plate *C C*, is fast to an arbor that turns between the dotted cock *M*, and the upper face of the plate, but projects through it to receive the wheel 120 and its pinion 23 below, to which they are pinned on a common tube; and the period in which this arbor revolves is

eight days, namely, $\frac{120}{15}$: above the plate, and on this same

arbor of eight days, is a wheel of 80, as seen in the detached *fig. 2*, (taken from the front of the centre of the box,) driving the wheel 70 in seven days; the arbor of this last wheel is pivoted into the plate *C C*, below, and into a cock not seen above, and its projecting end carries the weekly hand above the cover of the box; in like manner the projecting arbor *F*, which we have called the diurnal arbor, carries the hour index, both which are seen in the perspective drawing in *Plate VIII.* The wheel 61, already noticed as one of the annual train, has its teeth connected with another pinion of 23, hid under the plate, but seen sideways in the detached *fig. 3*, which gives motion to a third pinion, of the same number of teeth, placed on the vertical arbor, working in the dotted cock, which arbor, therefore, turns also in eight days, like the first pinion of 23; on this vertical arbor is a bevel wheel of 32, seen clearly in *fig. 3*, turning another of similar shape on the horizontal arbor with 28 teeth, which arbor, therefore, also turns in seven days, and answers to the index on the cover of the box, already called the week-hand. The use of this second horizontal arbor, or arbor of a week, which is represented as shortened, and without its cocks, is to receive the same handle whenever a quick motion is required to be given to the planets, after the diurnal motion of the earth is stayed, which is effected thus; the wheel of 61, under the plate *C C*, is not supported by this plate immediately, but turns on a pin or stud inserted into a long bar of brass *L L*, seen endwise in *fig. 1*.

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but lengthwise in *fig. 3*, which turns on a screw under the plate near the centre of the annual wheel, just enough to detach the teeth of this wheel from the pinion of 23 on the arbor of wheel 120 (*figs. 1* and *2*.) when required: as the centre of motion of this bar, *L L*, is near the centre of the large annual wheel 241, the pinion of 14, on the same arbor with wheel 61, does not quit its connection with the said annual wheel, but revolves a little way round it with their teeth in action, while the bar in question is moved sufficiently to detach wheel 61 as before stated: at the outward end of the said bar, *L L*, is fixed the dotted cock of *fig. 3*, and also the unseen cocks of the horizontal arbor for the weekly handle; these therefore, together with the bar, will move to the right and left the space of about a quarter of an inch, taken at the exterior end of the arbor. By this contrivance the wheel 61 can be made to have a connection with both the diurnal and annual motions, or only with the latter, as occasion may require; but when the diurnal motion is required, the handle will not enter the second hole in the side of the box to take the weekly arbor, now turned aside a little, which handle in that case is not wanted. The moveable bar, *L L*, has a hole tapped in its lower face, and a screw with a milled head ascends through the bottom of the box, in which it has a little play, to allow for the motion of the bar, which bar it then fixes underneath the box, in either the attached or detached situation of wheel 61. The utility of this contrivance will appear more clearly hereafter. The third arbor that appears above the box is the annual arbor of wheel 241, which carries the third or yearly hand; and the calliper is so contrived, that the three arbors for the hands form an equilateral triangle round the centre of the box, for the sake of uniformity of appearance. In the centre of the plate, *C C*, is screwed fast a rod of steel, *D D*, perfectly perpendicular, upwards of nine inches long, and somewhat more than a quarter of an inch in diameter, into the top of which the sun's stem is screwed, and round which thirteen concentric tubes are placed, twelve of which revolve within one another; and the bore of the last is an inch and a quarter. From the top of the outermost to the top of the innermost tube is a length of five inches and three quarters, constituting twelve steps up the frustum of a cone, as seen in *Plate VII.*; these tubes have each a wheel fixed to its lower end, which wheels make them revolve, together with their attached arms and appendages, in their respective periods. We come now to describe how these tubes have their motions communicated to them and their periods regulated.

The arbor, *E E*, of the annual wheel 241 revolves once in a solar year between the large plate *C C*, and the dotted bridge *K*, not entirely seen, which keeps it perpendicular: on this arbor are borne fifteen wheels and pinions, of which the four uppermost and the four undermost, shewn in section, revolve loosely in pairs pinned together respectively, and the seven intermediate ones, represented with teeth, are made fast to one another, and also to the arbor, and consequently revolve together in the space of a solar or tropical year. In this construction seven of the planets have their revolutions produced by each one pair of wheels, the numbers of six of which constitute so many improper fractions of a year, those for the earth having like numbers to express unity, or one year; but the two inferior and two remotest planets have each a train of four wheels, for the sake of greater accuracy in the periods, than simple pairs are capable of producing in a practical form; to these the annual arbor performs the office of an upright stud, or long pin, round which they may revolve, each pair in a separate plate, as their respective coadjutors direct; so that the construction is of a mixed nature, consisting partly of simple ratios, or pairs of wheels,

like that of the common planetarium, and partly of trains derived from compound fractions; and retains much of the simplicity of the cheapest instruments, while it possesses the accuracy of the most expensive. We might have begun with the longest tube, or lowest wheels, and have proceeded in the order of their succession, till we had explained the whole of the motions as they occur, but that the two interior planets derive their motions through the medium of each other, first from the Earth to Venus, and then from Venus to Mercury; so that we must necessarily begin from the motion of the earth, which takes that of the annual arbor unaltered, its wheels, one fast on the arbor, and the other on the tube, being each 85, by which is meant having each 85 teeth, and the period we have seen is $365^d 5^h 48^m 49^s$, very nearly. Under the wheel 85 on the earth's tube, but above the bridge, S, with the fixed tube, is screwed fast a wheel of 113, driving its fellow of 63 round the annual arbor, to which is made fast another driver of 58, which actuates a wheel of 64, made fast to the tube of

Venus under the bridge, the value of which train is $\frac{63}{113} \times$

$\frac{64}{58}$ of a solar year, or $224^d 16^h 41^m 53^s$; again to this last

wheel on Venus' tube is made fast the wheel 78 of Mercury's train, which impels its fellow 97 round the annual bar, below the loose pair of Venus, and has a wheel of 108 fast to it,

which again drives the wheel 34 on Mercury's tube in $\frac{97}{78} \times$

$\frac{34}{108}$ of Venus's period, or in $87^d 23^h 14^m 37^s$. It is of

importance that the periods of these two planets be correct, because an error in either of them would accumulate in the inverse ratio of the length of those periods, which, being both comparatively short, would soon render the error sensible by such accumulation. The motion of the diurnal arbor comes next above the annual wheel of 85, in order to be transmitted along the annual bar to the axis of the earth, carried at its remote end; but this motion is modified in a way that will be explained by and by: it is thus communicated; a wheel of 50 is made fast to the vertical diurnal arbor, that impels another of 100 fixed on the tube that next furrounds the annual tube already described: this latter wheel of 100, with its tube, therefore revolves in the space of two days, which is all the notice we shall take of it at present: above this comes the pair of wheels for the re-

volution of Mars, viz. $\frac{79}{42}$, the 42 fast on the annual

arbor, and the 79 attached to the tube, the value of which simple fraction of a year is $687^d 0^h 4^m 38^s$.

Next to the tube of Mars comes that of Vesta, with 29 fast on the arbor driving 106 on the tube in $1335^d 0^h 33^m 32^s$; after that 31 on the arbor drives 135 with the tube of Juno round in $1590^d 13^h 37^m 32^s$; and over these wheels a

common pair, $\frac{138}{30}$, carry both Pallas and Ceres round in

$1680^d 2^h 44^m 27^s$, by means of the 30, attached to the revolving arbor, impelling the 138 attached to their common tube. The pair of wheels which succeed the new planets

before Jupiter's wheels come, are $\frac{55}{70}$, the 70 fixed on the

vertical arbor of seven days, seen detached in *fig. 2*, and the 55 driven by it made fast to the tube, which by these means revolves in $5\frac{1}{2}$ days for the purpose of communicating motion to Jupiter's moons, in the manner we shall presently describe.

Above this tube of $5\frac{1}{2}$ days revolves Jupiter's in $\frac{166}{14}$ of a year, or in $4330^d 17^h 30^m 1^s$, the 14 on the annual arbor giving motion to 166 with the tube upon it, and this is the last of the seven simple pairs.

The motion of Saturn is derived from Jupiter's period in this manner, like that of Venus from the Earth; the wheel of 53 is attached to Jupiter's 166, and revolves with it, driving 50 round the annual arbor loosely, while 46 is pinned to it, which in its turn drives the wheel 121 made fast to

Saturn's tube in the period of $10746^d 21^h 18^m 25^s$, or $\frac{50}{53} \times$

$\frac{121}{46}$ of Jupiter's; and lastly, the train of Georgian takes its

motion from the tube of Saturn in a similar manner; the wheel 86 is fixed on the tubed wheel 121 of Saturn, and actuates the wheels 46 and 28 pinned together round the arbor, used as a stem, and the latter of them again urges

the wheel 149 on Georgian's tube in $\frac{46}{86} \times \frac{149}{28}$ of Saturn's

period, or in $30589^d 8^h 32^m 25^s$.

Thus twenty-eight wheels and pinions are employed to give the revolutions of the eleven primary planets, as taken from the annual arbor, which wheelwork alone would suffice to make an accurate planetarium by a similar application, without the other mechanism. The wheels for giving the sun's motion on his axis from Mercury, might have been added to the above described wheelwork, but it was judged better to omit them for the sake of simplicity and cheapness, especially as the motion of the solar spots, when they happen to occur, is the only phenomenon to be exhibited by such motion, which can easily be conceived from turning round the stem by which the sun is supported.

We return now to the diurnal motion of the earth and the periods of the secondaries, as exhibited in this machine, which form very interesting portions of the system. We have already traced the communication of motion from the diurnal handle to a tube of two days' period, next above the annual tube, but not ascending so high by one step, while that of the bridge ascends a step above. Though the earth's arm is only $7\frac{1}{2}$ inches long from the centre of the sun to that of the earth, yet it contains, in miniature, all the apparatus of the earth and moon, somewhat differently modified, that we have described as constituting the first portion of the orrery in three parts: the variations in the construction demand, notwithstanding, that we should give, in this place also, a detail of the numbers employed, and the mode of their application, to produce a like effect by mechanism more portable. It will not, however, be necessary to dwell so minutely on the uses of the different parts, as it would have been, if this arm had been described before the other instrument. The earth's annual arm, denoted by the letters *a b*, is a flat bar of brass, made firm by an edge-bar fixed above it, and having a cross-piece, *c d*, at its remote end, (seen in *fig. 4*. and partially in *Plate VIII.*) extending $1\frac{1}{2}$ from its centre one way, and $2\frac{3}{4}$ the other, to carry some of the wheels and other appendages, that Mars may avoid them in his orbit as the earth passes him: a slit tube, with a surrounding clamping piece and screw, is attached to the upper face of the bar, by means of which it is secured to the upper end of the tube of the annual wheel 85, by which it is carried round in a solar year; but along with this arm, and immediately under it, a contrate wheel of 96, with its teeth pointing downwards, and having a similar short slit tube and clamping piece, is pushed upon the end of the tube of two days' period, to which it is clamped

clamped fast, while its teeth are in connection with those of a pinion of 8 under the said arm; but great care is necessary, before the final clampings, that the pinion's teeth be put at a proper acting depth into those of the wheel: this pinion has an arbor extending the whole length nearly of the arm, and parallel to it, but is carried by two cocks beneath it, in a way similar to the horizontal arbor seen above the arm: the remote end of this lower horizontal arbor has a similar pinion attached to it, which drives another wheel of 48 teeth, also contrate, but with its teeth pointing upwards to alter the direction of motion; the time of a revolution of this latter wheel is, therefore, one day, or half the time of a revolution of 96 that revolves in two days: the diurnal wheel of 48, just described, has a solid arbor, supported by a bridge under the cross-piece of the arm at its lower pivot, and by the annual arm, which it penetrates at $\frac{5}{8}$ of an inch above: this arbor stands in a position perpendicular to the arm, and is three inches long, and about $\frac{7}{8}$ in diameter. On the upper end of this arbor is fixed, simply by friction, a small wheel of 36, impelling a similar one, a little bevelled, on the earth's axis, which, by this communication of motion, makes the earth revolve in one day when the annual motion of the arm is stayed; but when the annual motion is used along with the diurnal, the pinion revolves round the contrate wheel of 96, and gives the motion of 96 teeth or two days to the 48, which by this combination of two motions makes $367\frac{1}{4}$ instead of $365\frac{1}{4}$ revolutions in the year. A novice in calculations of this nature would pronounce this to be an error of two days in the year, as these two days' motion are transmitted without alteration to the earth's axis; but the truth is, the effect of this combination was not only foreseen, but taken into the calculation of the annual train as a compensation for a deduction of two days' motion, which the earth experiences from a combination, in another place, of an opposite nature, but to the same amount. The contrivance for keeping the earth's axis parallel to itself in all parts of its orbit, which we shall soon describe, gives the earth a retrograde motion annually, by which one rotation in the year is deducted from those given by the train; and as the two wheels of 36 are connected during this retrograde motion, the one that is fixed on the earth's axis makes a retrograde revolution in the same period, by being carried round the other during the lapse of the year, thereby making a second deduction of a day in the year: these two days subtracted from the $367\frac{1}{4}$, produced in the way above described, leave the number of days in a year $365\frac{1}{4}$, as in nature. It is to a want of a compensation of this sort that the old orreries and tellurians are most of them of little value in the solution of problems where time is concerned, as we have already had occasion to notice. It is but doing justice to the ingenuity of Janvier, the French mechanic, to ascribe to him the contrivance of this ingenious mode of compensation, which is very convenient when the diurnal handle is in a stationary situation, remote from the annual bar, as in the machine before us. Indeed, without some such contrivance, the diurnal motion of the earth, and also of the handle, could not have been perfectly effected. The retrograde annual motion, for keeping the earth's axis parallel always, is derived from the contrate wheel of 62, placed by a clamping piece over the annual bar on the fixed tube of the bridge, with its teeth downwards so as to catch the teeth of the pinion of 8 above the edge-bar of the annual arm. The axis of this pinion is, in fact, supported at both ends by projections made in the edge-bar itself, instead of the two cocks; and a similar pinion at its remote end gives motion to another contrate wheel of 62, with its teeth turned up, on account of the backward di-

rection of its motion. The tube of this last wheel, seen detached in *fig. 4*, furrounds the diurnal vertical arbor, and supports the bearing piece P, in *fig. 1*, on which the earth's axis rests, which axis will come out of the bearing piece when the pin with a circular head is drawn out of the side of the socket carried by this bearing piece; for a circular groove turned on the earth's axis, within the socket, allows the pin to pass at one side of it along the groove, by which pin it is kept in its place, and is yet at liberty to revolve. The small ecliptic circle O, for estimating the geocentric places of the moon and planets, rests also on this annual tube of retrogradation, or of parallelism, by means of which the signs marked on it are kept parallel to the larger circle of signs surrounding the sun. The lunation is derived from the annual wheel of parallelism, as is also the period of the nodes, thus; an annual wheel of 107, best seen in *fig. 4*, is made fast to the 62, and, partaking of its motion, drives a pinion of 12, through the medium of a pinion of 15, which only changes the direction of motion, and the arbor of the pinion 15, which is a tube revolving on a stud at the end of the cross-piece *c d*, carries on its upper end the wheel 86, which makes another wheel of 62 revolve, with

its tube, in a proper direction, in a period of $\frac{12}{107} \times \frac{62}{86}$ of a year, or in $29^d 12^h 44^m 1.2$, in which train the error is little more than one second *per* month in defect: in like

manner, the train for the period of the nodes is $\frac{24}{62} \times \frac{76}{31}$ of a

year, or 18 solar years, 23 days, 14 hours, and 49 minutes: 62 is the annual wheel, the 24 and 31 are pinned together, and revolve on a tube round a stud on the longer part of the cross-piece *c d*, and the 76 bears, on the upper end of its tube, the inclined circle, marked *nodes*, graduated for the moon's latitude, on which the moon's squared stem is supported as it moves forward in its orbit. The anomalistic revolution of the moon is taken from the lunation, and the train, contained in the monthly small frame, for giving the

principal equation and variation of distance, is $\frac{67}{64} \times \frac{46}{41}$ of a

lunation, or $27^d 13^h 18^m 32^s$, as in the larger machine before described. Before we take leave of the earth's arm, we think it right just to mention, that by reason of the compensation in the diurnal motion of the earth, neither solar nor sidereal time can be indicated on the arm itself; but we shall presently see, that these are both indicated by the same hand, on two separate faces, upon the cover of the box, where the reading is more convenient to the lecturer, while he turns the diurnal handle. It may be also requisite to mention here, that the equations of the moon's centre are inserted on the small plate R at the remote end of the monthly frame; and also that the fixed rim Q, that has the moon's age marked on it, and which is crossed out for lightness, is placed on the stationary tube carried by the cock T, that is seen between 62, the contrate wheel of parallelism, and 62, the lunation wheel next above. The furniture of the earth, which is a three-inch globe, is an horizon circle, a meridian circle, both adjustable, a quadrant of altitude adapted to the meridian circle, all graduated, an arc of illumination, and a solar lens U, for converging the light of the lamp, placed in the sun's place occasionally, into a focal point on the surface of the globe, which point, being luminous, shews the place of a vertical ray at all times, and in all positions of the globe, and affords the most natural as well as most easy means of solving all the variety of problems in which the sun is concerned. Immediately under the earth's arm a circular plate, N, is

clamped to the top of the stationary tube, on which are engraved a quadruple spiral graduated into day spaces in such a way, that February has 29 days every fourth year; and within this is an ecliptic circle corresponding to the sun's mean place on the respective days of the year, with a graduated circle within that to shew the equation of the sun's centre, by which his mean place is immediately converted into his true or apparent place, by addition or subtraction, as the case happens to be. The aphelion points of all the planetary orbits are likewise marked within the ecliptic, which assist in computing the mean anomaly of any planet at any time; from which the equation of its centre may also be ascertained and applied by the help of the proper tables calculated for this purpose. In the same manner, the place of the ascending node of each planet might be inserted, from which the heliocentric latitude might be easily deduced in problems, where great nicety is required. Indeed, exercises of this sort would render familiar the application of the tables themselves for finding the places, as given in the Nautical Almanac, and White's Ephemeris, without the assistance of those helps. The end of the annual arm is prolonged across this circular plate, and receives an index piece, V, in the form of a cock, that carries a filken thread stretched long enough to reach over all the divided circles, as well as the spiral, which thread at once indicates the day of the month in leap year, or any of the three following years, the sun's mean place in the ecliptic, and the corresponding equation, additive or subtractive, as the case may require. To the under face of this plate the contrate wheel of 62 for the earth's parallelism is screwed fast, and is thus attached to the fixed tube. As it was found convenient to make the earth's distance from the sun seven inches and a half, to allow for the introduction of a three-inch terrestrial globe to be put on, instead of the small ivory ball, when problems are to be solved by it, this distance became the standard by which the other distances were to be ascertained. As far as Mars, inclusive, the proportional distances are preserved; but beyond Mars certain proportional parts were necessarily adopted, instead of the whole distances, which in Saturn would have been 73 inches, and in Georgian 144. The following table contains the scale of distances which appeared to be, on the whole, most desirable to fix upon for the respective lengths of the arms, that revolve with the planetary balls in this machine; and those of Saturn and Georgian are made of tubes that slide within one another for the sake of lightness, as well as of packing.

Table of Distances from the Sun.

Mercury	2.89 inches.
Venus	5.45
Earth	7.5
Mars	11.45
Vesta	13.4 viz. $\frac{2}{3}$ of 15.3
Juno	15.9 $\frac{2}{3}$ of 19.9
Ceres and Pallas	} each 16.6 $\frac{4}{5}$ of 20.7
Jupiter	
Saturn	21.9 $\frac{3}{5}$ of 73
Georgian	24.0 $\frac{1}{6}$ of 144

In order that an exact idea may be formed of the real proportional distances of Vesta and the planets beyond, as compared with that of the earth, six holes are drilled and tapped along the earth's arm, at the same proportional distances from the sun, that the scale of this table requires, into any one of which holes the stem of the small ivory ball may be screwed; from which holes the respective planets must be supposed to be viewed, to gain the geocentric places respectively. For instance, if the geocentric place of Mars be

required at any time, first allow for the equation of the centre from the table made for this purpose, by turning the planetary ball forward or back from its mean place, by a joint made for this purpose at the insertion of the upright wire at the remote end of the arm, the quantity may be estimated by the ecliptic circle, which stands in a convenient situation for referring the places to: this being done, stretch a filken thread, from the earth's stem, screwed into the fourth hole from the sun in the earth's arm, till it lays over the centre of Mars' ball; then a second thread drawn parallel to this, either from the earth, or from the sun, as may be most convenient, will cut the geocentric place of the planet in the small or large ecliptic circle, whichever be used. This use of the parallel threads answers the same purpose as placing an ecliptic circle in a parallel situation round the hole where the earth's stem is inserted for rendering the two given distances exactly proportionable. This contrivance affords the means of working problems connected with the geocentric appearances, as well as if the arms had been all lengthened into due proportion; for when the geocentric places are ascertained, the upright wires, by being turned on their centres of motion, will bring the planets into the ascertained geocentric places, without moving the arms of mean motion out of rectification: for Saturn and Georgian, the tubes afford the means of doing this by turning one within another.

We come now to explain the mechanism connected with, and carried by, Jupiter's arm, which we have seen is 19.6 inches long: it will be recollected that we have traced the transmission of motion from the seven days' arbor to a tube of $5\frac{1}{2}$ days, revolving next within Jupiter's tube: upon the upper end of this tube of $5\frac{1}{2}$ days, a contrate wheel of 60 is clamped with the teeth pointing down towards Jupiter's arm, with which it comes in contact: this arm is a long tube, and admits an arbor of the same length within it, which, consequently, is not seen, except where the arm is disunited: this long horizontal arbor has a pinion of 8 at each end of it, one of which is impelled by the said wheel of 60, which descends through a notch made in the upper side of the arm or tube, till it catches the pinion; and the other drives a similar wheel of 60 at the remote end of the tube, where a notch is made under the tube, through which the teeth of the wheel, pointing upwards, catch the teeth of this pinion. Now it is evident, from the similar numbers, that if Jupiter's arm had no motion, this last contrate wheel of 60 would revolve in $5\frac{1}{2}$ days, as the other 60 does; but the motion of the arm round the sun alters this period a little, which alteration must be ascertained, before we explain the mechanism of the satellites, which derive their motions from this altered period. As the first pinion of 8 revolves round the first wheel 60 in

Jupiter's period, it is made to revolve $\frac{60}{8}$, or $7\frac{1}{2}$ times in this

period oftener than it would have done in a fixed position. Again, the second pinion of 8, which may be considered as the same pinion prolonged within the tube, gives its $7\frac{1}{2}$ revolutions to the second wheel of 60, which, therefore, makes just one revolution in Jupiter's period more than it would have done without the motion of the arm; the consequence is, that the time of its revolution is less than $5\frac{1}{2}$ days, by a quantity that will amount, by accumulation, to $5\frac{1}{2}$ days in Jupiter's period. This quantity may be thus ascertained; the period produced by Jupiter's wheels is 4330.72916 days; hence, as $4330.72916 : 4325.422916 :: 5.45 : 5.493014$; that is, as the whole period is to the period diminished by 5.5 days, so is the whole time of the wheels' calculated revolution, to its diminished period of a revolution: and as a proof of the correctness of this statement,

ment, if we multiply the whole period of Jupiter by .006986, the difference between the two last terms, or the acceleration in each revolution of the wheel, the product will be 5.5 days, or an acceleration of one entire revolution in the said period. Instead, therefore, of 5.5 days, we must take 5.493014 as the time of revolution of the remote wheel of 60, the arbor of which is made the common arbor of four other wheels, which drive each another wheel, soldered to as many tubes respectively, to carry the arms of the four satellites, as seen in the drawings. The wheels, with their respective periods corresponding, are contained in the subjoined table, where it is to be understood that the denominators of each fraction are the drivers made fast to the arbor of 5.493014 days, and the numerators are the wheels fast to the tubes respectively.

TABLE of Jupiter's Satellites.

Satel.	Wheels used as Fract.	Periods corresponding.	Errors in each Period.
	D.	D. H. M. S.	I II
1	$\frac{29}{90}$ of 5.493014	1 18 28 45.49	+ 0 9.49
2	$\frac{33}{51}$ of ditto	3 13 18 11.78	+ 0 17.78
3	$\frac{60}{46}$ of ditto	7 3 57 18.8	- 2 17.2
4	$\frac{61}{20}$ of ditto	16 18 5 19.05	+ 0 12.05

The common arbor is held in a vertical position by two cocks, one above the end of the tube, and one below, which also holds the stem of Jupiter, round which the tubes revolve, and likewise the cross piece seen in *Plate VII.* which supports a paper screen for receiving the shadows of the satellites when a lamp is used; but when a lamp is not used, a conical piece of brass fits on the stem behind Jupiter, to represent the shadow of his body, and to explain the immersions or emerfions of the fecondaries as they revolve. The distances of the satellites are taken in diameters of the small ball that represents Jupiter. For a description of other instruments, that have been constructed to answer this purpose separately, we beg to refer to our article *SATELLITE Instrument.*

We have now arrived at the faces on the cover of the box, and the wheels that guide the indications, which will conclude our description of this machine. On the vertical diurnal arbor that carries one of the bevel wheels at first described, is inserted an adjustable hand that indicates mean solar time, on a rim of 24 hours fixed to the cover of the box: this rim is $3\frac{1}{2}$ inches in diameter, and $\frac{3}{8}$ broad; within this rim and in the same plane revolves a circular dial of 24 hours in a retrograde direction, just once in a solar year; and the same hand that indicates mean solar time on the fixed rim, indicates also sidereal time on the revolving dial with equal accuracy; for as the revolving dial meets the hand the

space of $\frac{1}{365.242}$ of a circle sooner in each successive revolution, one day more in a year is indicated on this revolving dial than on the fixed plate, in the way that is done in *Marggett's* chronometer, but with much more accuracy, as the train here, between a day and a year is perfect. In order to produce this retrograde motion of the little dial of 24 sidereal hours, one pinion only was necessary, which is fixed at the bottom of a tube that revolves round the diurnal arbor as a stud, and carries the dial on its upper extremity. It will be recollected that a pinion of 14, fixed to the annual arbor, drives a large wheel of 166 for the motion of Jupiter: now a

similar pinion of 14, placed over the bevel wheels, round the diurnal arbor, which is at the same distance as the annual arbor from the edge of 166, will act with it in this situation also, and will revolve in the same time that the first 14 does, which has been shewn to be a solar year. The intermediate wheel of 166 only transmits the motion unaltered, except as to its direction, which otherwise would not have been retrograde: thus from means the most simple, results of the utmost importance are derived, both as to utility and accuracy; and, what is not to be overlooked, the indication falls immediately under the eye of the lecturer, who must necessarily stand at the handle of the machine, while he is giving his lecture. The weekly vertical arbor, seen detached in *fig. 2.* stands at the same distance from the sun, or centre of the box, as the other two arbors, and, as has been said, forms with them an equilateral triangle. Another rim, similar to the one just described, is also screwed round the top of this arbor to the cover of the box, and contains the seven days of the week, which are pointed to by a hand placed in an adjustable manner on the projecting arbor, as shewn in *Plate VII.* This arbor also serves instead of a stud for two concentric tubes, one revolving in the solar year, and the other in the period of Jupiter: the former, or inner tube, is every way similar to the one we have just explained, namely, a pinion of 14 takes the annual motion through the medium of Jupiter's 166, and carries this tube, to the upper end of which is adjusted a second hand, that indicates the time of Jupiter's meridian passage on any given day, upon an horary circular plate placed on the outer tube, which revolves in the period of Jupiter, and which is just large enough to fill the circular space on the cover that was left within the fixed rim for the seven days: this motion is produced by means equally simple; the first wheel of the train that connects Saturn with Jupiter is 53, revolving fast to the 166, and therefore in Jupiter's period, this wheel happens to occupy very nearly half the distance between the centre of the box and the weekly arbor, and therefore admits another wheel of 53 to act with it from this arbor, and this 53 revolving in the same direction as the 14 under it, and, in the period of Jupiter, carries on its tube an horary dial, over which the annual hand passes in the synodic revolution of the earth, as compared with Jupiter. This little dial, if divided into 360° , would have shewn the distance of Jupiter to the sun at any time, as seen from the earth, but it was thought to be more convenient to shew this distance in time, which therefore represents Jupiter's meridian passages when the index is put to XXIV on the day of Jupiter's conjunction with the sun. In the same manner the time of culminating of any other planet might be indicated. Indeed, if an horary circle could conveniently be attached to the earth's arm, round the centre of its motion, under the large graduated circle of days, &c. the planetary arms would be so many indexes, though at some distance above and below it, to point out thereon the respective times of culmination of all the primary planets, agreeably to their mean motions. Jupiter's time of southing is, however, a matter of daily importance, as it is a guide to his visibility or invisibility at any given hour, when the eclipses of his satellites occur, and also shews whether the immersions or emerfions of these fecondaries take place; that is, whether Jupiter is before or behind the sun, or, in other words, more or less than 12 hours from the sun, as seen from the earth. Lastly, the third rim, fixed to the cover of the box, round the annual arbor, has a circle of the sun's declination engraven on it, and another circular face made fast within it, just large enough to fill the vacant space, on which face the reduction of the ecliptic to the equator is inserted: these two faces require no additional wheelwork, but are pointed to by one hand adjusted to the top of the annual arbor, over the

stack

The pinions on the earth's arm may be any two of equal numbers, both above and below; likewise on Jupiter's arm, and at the earth's axis: and when the diameters are taken, it is understood to be across from the pitch line to the pitch line, without the ends of the teeth, which will be inversely in length, as the number of teeth *per* inch.

Orrery by Antide Janvier.—A French work has just come to our hands, entitled “Des Révolutions des Corps Célestes par le Mécanisme des Rouages,” 1812, Paris, by an eminent mechanic, whose contrivances have been honoured by an examination and report upon them, made by the class of physical and mathematical sciences at the Imperial Institute of France. The author of this work, which is a thin quarto with eight plates, begins his description of his new planetary machine, which corresponds to our definition of an orrery, by saying that “while the arbiter of Europe, at six hundred leagues distance from his capital, is directing, under another sky, the vast conceptions of his genius, and of his policy, in the obscurity of our retreat, without a mission and without a title, we presume to form an enterprise almost beyond the reach of our powers, at a time when our intellectual faculties have arrived at their full extent; but the favourable regard of the great Napoleon, the coup-d’œil of Maria Louisa, the desire of becoming useful to the instruction of an august prince called to succeed to so much glory, and to bear so many diadems; what more can be wanting to support our courage, to enliven our hope, and to furnish us with new activity for the culture of an art, in which we have already obtained considerable success!”—Such is the exordium to the description of this machine, from the perusal of which we had hoped to gain much useful information for the service of our readers, as well as amusement for ourselves; but, to our disappointment, the author has not favoured the world with an account of the numbers that constitute the teeth of his wheelwork, and gives us a reason for such omission, the existence in Paris, which we do not doubt, of a faithless set of people, who have the assurance to avail themselves of other men’s labours, and to persuade the world that they are their own. However, as there is considerable ingenuity manifested in the arrangement of the different parts of this machine, as contained in his plate IV. and as we trust that we have rendered the methods of calculating suitable numbers for representing any given period sufficiently easy under our article *NUMBERS Planetary*; we shall give the substance of the account, as it is before us, and leave the reader to exercise his skill in determining for himself such practical numbers as this particular construction demands, which task will afford a variety of further examples to our theory. In *Plate VI.* of our series, entitled *Planetary Machines*, we have given a reduced copy of the section of all the wheelwork of this machine, which bears considerable resemblance to the following plate, which is the section of a new orrery constructed in England, immediately before the account, at present under our notice, arrived, and which we have described as being the most modern and comprehensive. A A B B, in *fig. 1.* represents the section of a brass frame kept together by the pillars *a, a*, and supported by a table $5\frac{1}{2}$ French feet in diameter, not seen in the plate. In this frame are contained the wheels for giving motion to the Earth, Mars, Jupiter, Jupiter’s moons, and Saturn’s moons; upon the upper plate of this frame is mounted a smaller frame, Y Y, supported by the short pillars *z, z*, containing the wheels for giving motion to Saturn and Georgian, (or Herschel,) and above this small frame is another wheel for giving motion to the moons of Georgian. The interior planets Venus and Mercury have their wheelwork on the earth’s arm, under the sun, and the wheels for the satellites are at the extreme ends

of the respective arms, while such portions of the mechanism as could not be seen in *fig. 1.* are shewn in a detached state in *figs. 2* and *3.* We shall retain the letters of reference of the author himself, and, in a great measure, his order of description, but shall endeavour to avoid some of his repetitions. A long fixed axis of steel rises out of the centre of the lower plate of the large frame, to which it is screwed, by means of a circular shoulder-piece, fast to the said axis, into which axis the sun S has its slender stem screwed; the double wheel C D, with the part C contrate, turns in 48 hours, communicating motion to the earth’s axis, and to our moon, by wheelwork placed at the upper end of a long tube, fast to the double wheel, and revolving round the fixed steel axis; but this motion is taken from the wheel *x*, of half the size of the contrate wheel C, fixed on the horizontal arbor of the diurnal handle M. This arbor has two drivers fixed on it besides *x*, namely, the contrate wheel *y*, driving the pinion *d*, and the pinion *b*, driving the contrate wheel E on a vertical arbor; to this arbor a second pinion, *c*, is fixed, which drives the wheel F on another vertical arbor, and with it a ratchet wheel above, and the pinion *d*, before-mentioned, below it, and this pinion *d* again drives the wheel G in a year, which is therefore called the annual wheel. The pivot of the horizontal diurnal arbor is supported by the cock marked 13, and the arrangement of wheels and pinions which we have described is such, that whether the handle of the diurnal arbor be turned round to the right or left, the annual wheel, G, will always proceed in the same direction, as may be thus explained: what may be called the slow motion, where $365\frac{1}{4}$ turns are made in a year, is transmitted through the successive pinions *b, c*, and *d*, to the wheels E, F, and G, in the regular way; but when a retrograde motion is given to the handle, the pinion *d* is driven by the contrate wheel *y*, with a velocity one hundred times increased, and yet in the same direction as before; the wheel *y* has also a ratchet wheel behind it, like as the wheel F has, which ratchets allow their contiguous wheels to move loosely round their arbors one way round, but the clicks fast to the wheels catch the teeth of the ratchets when going the other way, and attach them to their arbors respectively; but whenever the click of ratchet F impels this ratchet’s teeth, the click of ratchet *y* slides without entering its teeth, and *vice versa*, the two ratchets having their teeth so sloped in opposite directions, that they never oppose each other’s action, but, on the contrary, when one ceases to act, at the instant the handle retrogrades, the other begins, and thus the pinion *d* continues its motion in the same direction at all times, if the handle move at all; but when the contrate wheel acts as its driver, its velocity becomes increased one hundred times, by being derived immediately from the handle through the wheel *y*, while the wheels E and F, with the pinion *c*, are moving in a detached state, and in a reversed direction, thereby producing no effect on the pinion *d*, which is also the case with wheel *y*, when the handle goes by a direct motion. This contrivance for giving both slow and quick motion alternately, is simple but ingenious, and the author says he introduced a contrivance for making all the planetary bodies move backwards, when required, as well as forwards, which cannot be done with the ratchet acting in the usual way; but he has not thought proper to explain his method; though he says that it is by the use of the quick motion that the backward motions are effected by a third contrivance. This contrivance, however, becomes obvious on a little reflection, which may be thus: the exterior end of the diurnal arbor may be lowered by a sliding motion of its bearing-piece, till the teeth of pinion *b* are detached from wheel E, while yet the teeth of the contrate wheel *y* will continue in action in pinion *d*, by reason

of its being nearer the interior end of the horizontal diurnal arbor, which is therefore not so much lowered as the exterior end, while the interior pivot remains in the hole of its cock: it will be necessary, notwithstanding, to pin the ratchet to wheel *y*, for the time that this wheel is made to act in both directions, which may be readily done when a hole is drilled through both the ratchet and wheel *y* at the same distance from their centres of motion, and by the same drill. The tube of the annual wheel *G* turns immediately upon that of the double wheel of 48 hours, but rests on the bridge 13, which supports the superincumbent weight of the mechanism borne by this annual tube. Under the annual wheel *G* is made fast to it the small wheel *e*, that drives the wheel *f*, on a separate vertical arbor, resting on the bottom of the large frame, and supported at top by the brass plate *Y Y*, in the upper or small frame, which plate is said to be circular. On this vertical arbor of *f*, are made fast three other drivers, one wheel and two pinions, denoted by the letters *g*, *h*, and *i*; wheel *g* drives the tubed wheel *H* in the period of Mars; *h* drives the wheel *I* with its tube in the period of Jupiter; and *i* drives the wheel *K* in the small or upper frame, in the period of Saturn. The bridge 14, above the annual wheel *G*, has a tube fixed to it, as seen in *fig. 2*. along with bridge 13, without a tube. The use of this tube will be seen presently. To the wheel *I* of Jupiter is made fast the smaller wheel *k*, which drives wheel *A*, placed on another vertical arbor, seen in *fig. 3*. detached, which arbor is supported behind the other works, in the manner that we have described the arbor of wheel *f* to be; then wheel *B*, on the upper part of this vertical arbor, drives wheel *L* in the small frame above *K*, in the period of Georgian; hence the revolutions of Mars, Jupiter, and Saturn, are trains from the motion of a year, but the revolution of Georgian is by a train from the motion of Jupiter. Above the upper frame is placed a cock *C*, seen in *fig. 3*, which supports the fifth and last vertical arbor, with the wheels 10, 11, and 12 fast to it, at different heights, proportioned to the heights of their fellow wheels; wheel 10 takes its motion from wheel *D* of 48 hours, and wheel 11 drives *N*, which has a quick motion of 48 hours also, if we may judge from the comparative diameters of these four wheels, *D* and *N* appearing to be each double to 10 and 11; but the pinion 12, at the top of the fifth arbor, drives wheels *o* more slowly, for the first mover of Georgian's satellites. The bridge 15 has also a tube fast to it, which will have its use described in its place. The rest of the mechanism which follows stands above the frame, and is in sight, which we will now proceed to describe, as we ascend from the frame. The large contrate wheel *o*, with its teeth pointing upwards, is fast to the top of the tube of wheel *O* above the frame, that revolves round the tube of wheel *L* in the small frame; this wheel *o* gives motion to Georgian's satellites, by means of the long pinion seen over it, which is carried round by Georgian's arm in his period, with their teeth in connection, on which account this long pinion has a compound motion, one part of which is derived from the revolutions of wheel *o* coming more immediately from the handle, and the other arises from the motion of the arm that carries the pinion round the large wheel in Georgian's period; this second portion, being in the same direction as the principal motion, produces an acceleration in the motion of the pinion, of as many revolutions as its teeth are contained in those of the wheel, during the whole period of Georgian. The arm is not, as usual, placed on the top of Georgian's tube, but turns round an excentric circular piece of brass *W*, attached to the top of a tube, borne by the plate, *Y Y*, of the small frame, and receives its motion from a pin 3, at the remote end of a bar 3 7, which

bar is inserted on the tube of Georgian's wheel *L*, and revolves in his period; hence the arm itself revolves round the excentric piece, *W*, as its centre of motion, and therefore the planet carried by it has its distance and velocity constantly changing in every part of its orbit, as have also the secondaries, in a certain degree. But it is not mentioned what proportion the excentric point, or centre of piece *W*, measured from the centre of the concentric tubes, bears to the whole arm, or radius vector: if it is in the same ratio as the excentricity of the orbit itself is to the planet's mean distance, then the variation of distances will be properly enough represented in the excentric orbit, but the equations of the centre will be only one-half its due quantity; on the contrary, if the excentric point be placed at double the distance of the proportional excentricity of the orbit, then the equation will be right, but the variation of distances will be too much by one-half; which observation is equally true, as it respects the other excentric arms hereafter to be described. The arm of Georgian has a long opening in the direction of its length, to admit the pin 3 to pass through it, which therefore acts like the crutch of a clock, except that here the motion imparted is always in one direction. The horizontal arbor of the long pinion has another pinion at its remote end, that is not required to be long, because its action is not with a wheel that is perpetually altering the effective length of its radii, as is the case with the large wheel *o*. The six moons of Georgian receive their motion from this short pinion thus; the contrate wheel, *c*, is made, by the calculation, to revolve in the period of the first satellite, or in $5^d\ 21^h\ 25^m$, and carries wheel *d* round with it in the same period; then wheel *e* takes this motion, whether modified or not does not appear, and its arbor takes four pinions, one above another, which drive each its fellow, on a small tube, in the respective periods of the 2d, 3d, 4th, and 5th satellites; but the period of the 6th satellite, being comparatively long, is taken from the period of the 5th, by the wheel *a* driving *b* on a separate arbor in $38^d\ 1^h\ 49^m$; while a second pinion, placed over it, drives the wheel *R*, of the 6th satellite, in its period of $107^d\ 16^h\ 40^m$. From a consideration of this combination of wheels and pinions, the reader will see that Georgian's moons, like the long pinion, have their mean motions accelerated in one part of this planet's orbit, and retarded in the other, by reason of the long arm having its centre of motion out of the centre of the large wheel's motion; the latter of which may be said to give the mean motions, and the former the equations, or variations that derange those mean motions, and that depend on the place of Georgian's anomaly at any time. In like manner, Saturn and Jupiter have their systems of moons actuated by the double contrate wheel *nn*, carried by the tube of wheel *N* before described: the teeth that point downwards drive Saturn's moons, and those that point upwards Jupiter's. The excentric piece, round which Saturn's arm revolves, is marked *Z* on the fixed tube of the plate *A A* of the frame; and the bar 5 6, that impels this arm by the pin 6, is fast to the tube of wheel *K* in the small frame: the long pinion, carried round by the arm of this planet, is in connection under the wheel *nn*, which impels it, but experiences the same sort of acceleration that we have described in the case of Georgian's long pinion: the short pinion at the remote end of the arm acts also under the teeth of its contrate wheel *a*, that, we are told, revolves in $0^d\ 22^h\ 40^m\ 4.56$, or period of the first of his seven satellites. From this period wheel *b*, on a side arbor, takes its motion, and carries four other pinions above it, which drive their corresponding tubed wheels 2, 3, 4, and 5, in the periods of the 2d, 3d, 4th, and 5th satellites; from the period

period of the 5th, viz. $4^d\ 12^h\ 27^m\ 55^s$, the wheel c gives motion to another side arbor, by means of wheel d ; and this last arbor carries again two driving pinions, that impel the two last wheels 6 and 7, the latter of which, near Q , is said to revolve in $79^d\ 22^h\ 3^m\ 12^s$. Again, Jupiter's arm, tt , revolves round the excentric piece q , placed on the tube of bridge 15, and is counterpoised by the weight $t\ 3$; this long pinion, a , acts, like Georgian's, above the large double contrate wheel nn , and experiences a similar acceleration to that of Saturn in kind, but not in quantity; for the excentric pieces are of different dimensions, and each is placed in the direction of its own line of the apsidæ: the bar 3 4, on the tube of wheel I , drives this arm by the pin 4, entering the oblong perforation in the arm tt , and the short pinion, b , drives the contrate wheel, c , at the remote end of the arm, in $1^d\ 18^h\ 28^m\ 36^s$, the period of the first satellite of this planet; the wheel attached to this contrate wheel, c , drives d , on a side arbor, and with it three more pinions on this common arbor, each of which impels its fellow 2, 3, and 4 respectively in the periods of the 2d, 3d, and 4th satellites. The little arms of all the satellites are connected with as many tubes, taking their motions from the last moving wheels, as seen in the drawing, without further description; but it will have been remarked, that all these secondaries in this machine are made to move in the same plane with that of the ecliptic, which in nature is the case with Jupiter's only; consequently the motions of both Georgian's and Saturn's moons, however accurately their periods may be produced by the wheelwork, are in improper directions relatively to the orbits of their primaries, as well as to all the other parts of the solar system. Next above Jupiter comes the arm of Mars, revolving round the excentric piece p , placed on the tube of bridge 14, and impelled by the pin 2 of the bar 1 2, attached to the tube of wheel H : this planet, consequently, has an excentric motion in his orbit; but having no moons, requires only a simple arm. Over Mars is placed the Earth's annual arm with its appendages, which are necessarily on a small scale, and which the author has put in an enlarged section on a separate plate, containing the mechanism for the earth's parallelism and diurnal rotation, the periodic motion of the moon, and the retrogradation of the nodes of her orbit, together with the revolutions of Venus and Mercury round the sun; all which we will now describe in succession. The wheel r is fixed fast to the tube of bridge 14, and ss , the earth's arm, or annual frame, revolves with the tube of the annual wheel G , before described: the wheels under this frame are destined to preserve the parallelism of the earth's axis, in order to do which exactly, the first and third wheels must be of like numbers, with any number for the intermediate one to change the direction of motion; but the author proposes a train that may make the pole of the ecliptic have a revolution in 25,670 years, or to fall back one degree in 72 years, for effecting the precession of the equinoctial points: the train that he proposes to use for this purpose, to be substituted for the ordinary wheels of parallelism, are $\frac{151}{133} \times \frac{170}{193} = \frac{25670}{25669}$, in which fraction there is

a difference between the numerator and denominator of unity; or $\frac{1}{25669}$ part of the whole would be the annual

quantity of deviation from strict parallelism; but it is easy to see, that the adoption of these large numbers would require the earth's arm to be much longer than its proper proportion in the machine requires to contain them; or otherwise the excentric pieces would require to be greatly, and therefore inconveniently enlarged, by adding to the length of the planetary arms, and the long pinions would by such

alteration become too much elongated for due action in both femicircles of their respective wheels. On the top of the axis of the third wheel of parallelism is supported the earth by an exterior ring, into which his axis is pivoted above and below, and by means of which any quantity of inclination may be given to this axis, with respect to a perpendicular line. The second, or intermediate wheel of parallelism, has however the same number of teeth as the other two, with which it is connected, and has a vertical arbor supported by the same cock under the earth's arm, that supports the arbor of the third wheel and the earth above it; we shall presently see the use of this, which we will call the annual arbor, as it revolves just once in each year: just above the earth's arm revolve also three other wheels, u , v , and w ; the wheel u is on the tube of CD of 48 hours, v revolves in the same time, but w , having only one-half the number of teeth, makes a revolution in 24 hours, or rather would do so if the earth's arm had no annual motion; but by reason of the annual motion, the wheel w receives two additional revolutions in the year, and these two additional revolutions are balanced by a drawback of two days, occasioned partly by the retrograde motion of the wheel of parallelism, which carries the pinion of the earth's axis once round the central pinion on the tube of 24 hours motion, thereby making it revolve, and partly by the earth's circuit round the sun, whilst the axis preserves its parallelism, by which circuit the sun appears to move retrograde round the earth once in a year. This balance of the two opposite compound motions has been minutely explained in our description of the preceding instruments, to which the reader is referred. The little earth has besides two interior circles surrounding it, one for a meridian circle, and the other for an horizon, which is adjustable for any latitude, by sliding up and down within the other, while the pivots of an equatorial fixed axis allow the horizon circle to turn on them for effecting the different degrees of inclination. The moon's monthly motion is taken from the second wheel of 48 hours by a train of two pinions, and as many wheels, seen in the figure, supported by the two cocks above the annual frame. We have already said that the second, or middle wheel of parallelism, under the annual frame, has a vertical arbor, which we proposed to call the annual arbor: on the upper end of this is a wheel which drives the nodes wheel round in its period of $6798^d\ 4^h$, and the tube of this wheel carries the inclined plate on which the moon's stem rests during her monthly motion in the usual way. Again, the upper wheel on the annual arbor, which is represented in a line with wheel x , but which is actually on one side of it, and in contact with it in the machine, gives motion to this wheel x , on an arbor that has besides both a pinion and a wheel made fast to it: these two, revolving together probably in the space of a year, drive each a corresponding wheel and pinion, namely, the pinion for Venus drives wheel y , and the wheel for Mercury the pinion z , each with its respective tube and attached arm, in their due periods. In this arrangement, the planets Venus and Mercury, as also the Earth and Moon, move in their orbits with equable motion; but in the enlarged section above alluded to, the author recommends the introduction of an excentric piece without a fixed tube (which, indeed, cannot be here introduced), but a pair of wheels are proposed to be added to preserve the annual parallelism of this excentric piece, thereby rendering the mechanism more complex than useful, as it relates to Venus; for this planet has but little excentricity in its orbit, and consequently a very small equation of its centre. The suggestion of this mechanism, which does not appear to have been adopted, is intended apparently to shew the ingenuity of the contriver rather than the utility of its adoption

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ORRERY.

Argument.	Equation.	Argument.	Equation.
Apogee	0° 0'	Perigee	0° 0'
41 51.3	4 0	36 53.1	4 0
48 19.5	4 30	42 43.6	4 30
55 33.9	5 0	49 19.9	5 0
64 7.1	5 30	57 15.4	5 30
74 45.7	6 0	68 16.4	6 0
94 0	6 18 31".6	86 0	6 18 31".6

TABLE V. For the Moon's mean heliocentric Latitude.

Argument.	Latitude.
Node	0° 0'
2° 47.1/2	0 15
5 34.9	0 30
8 23.3	0 45
11 12.9	1 0
14 4.0	1 15
16 57.6	1 30
19 53.7	1 45
22 53.2	2 0
25 56.7	2 15
29 5.1	2 30
32 19.3	2 45
35 41.7	3 0
39 11.0	3 15
42 52.5	3 30
46 47.8	3 45
51 1.8	4 0
55 41.4	4 15
60 59.4	4 30
67 22.6	4 45
76 18.1	5 0
90 0	5 8 48".9

TABLE VI.—Table for graduating the Moon's horizontal Parallax to the mean Excentricity of .055, &c.

Argument.	Moon's Horiz. Parallax.	Argument.	Moon's Horiz. Parallax.	Argument.	Moon's Horiz. Parallax.
Moon's true Anomaly.		Moon's true Anomaly.		Moon's true Anomaly.	
O. 0 0	54.0	II. 11 20	56.2	III. 22 18	58.4
9 0	54.1	13 20	56.3	24 20	58.5
17 0	54.2	15 20	56.4	26 20	58.6
22 30	54.3	17 10	56.5	28 20	58.7
27 0	54.4	18 54	56.6	IV. 0 22	58.8
I. 0 36	54.5	20 42	56.7	2 42	58.9
4 0	54.6	22 30	56.8	4 52	59.0
7 0	54.7	24 18	56.9	7 6	59.1
10 0	54.8	26 6	57.0	9 22	59.2
12 52	54.9	28 2	57.1	11 36	59.3
15 45	55.0	III. 0 0	57.2	14 8	59.4
18 14	55.1	1 48	57.3	16 42	59.5
20 42	55.2	3 36	57.4	19 30	59.6
22 50	55.3	5 24	57.5	22 30	59.7
25 0	55.4	7 12	57.6	25 30	59.8
27 8	55.5	9 0	57.7	28 48	59.9
29 15	55.6	10 48	57.8	V. 2 24	60.0
II. 1 21	55.7	12 4	57.9	6 45	60.1
3 20	55.8	14 35	58.0	12 0	60.2
5 20	55.9	16 30	58.1	19 30	60.3
7 20	56.0	18 21	58.2	27 0	60.35
9 20	56.1	20 12	58.3	VI. 0 0	60.35

TABLE VII.—For graduating the Moon's mean horizontal Diameter, the Excentricity being .055, &c.

Moon's Horiz. Paral.	Moon's Horiz. Diam.	Moon's Horiz. Paral.	Moon's Horiz. Diam.	Moon's Horiz. Paral.	Moon's Horiz. Diam.
54.00	29.7	56.18	30.9	58.36	32.1
54.18	29.8	56.36	31.0	58.54	32.2
54.36	29.9	56.54	31.1	58.72	32.3
54.54	30.0	56.72	31.2	58.91	32.4
54.72	30.1	56.91	31.3	59.09	32.5
54.91	30.2	57.09	31.4	59.27	32.6
55.09	30.3	57.27	31.5	59.45	32.7
55.27	30.4	57.45	31.6	59.64	32.8
55.45	30.5	57.64	31.7	59.82	32.9
55.64	30.6	57.82	31.8	60.00	33.0
55.82	30.7	58.00	31.9	60.18	33.1
56.00	30.8	58.18	32.0	60.36	33.2

TABLE VIII. Equations of the mean high Tides.

Distance of ☉ to ☾.	Perigee of ☾.	Mean Diff. of ☾.	Apogee of ☾.
Argument.	Equation.	Equation.	Equation.
0°	+ 18"	+ 22"	+ 27 1/2"
10	9 1/2	11 1/2	14
20	0	0	0
30	9 1/2	11 1/2	14
40	18	22	27 1/2
50	26	31 1/2	39 1/2
60	33	40	50
70	37 1/2	45	56
80	38 1/2	46 1/2	58
90	33 1/2	40 1/2	50 1/2
100	21	25	31
110	+ 0	+ 0	+ 0
120	21	25	31
130	33 1/2	40 1/2	50 1/2
140	38 1/2	46 1/2	58
150	37 1/2	45	56
160	33	40	50
170	26	31 1/2	39 1/2
180	18	22	27 1/2

In *Plate IX. of Planetary Machines*, we have given the eight circles, properly graduated from these eight tables, a comparison of which, with their respective tabulated numbers, will render the method of putting in the dividing strokes perfectly intelligible. The tables proper for the equations, latitudes, &c. of the other planets will be given under our article *PLANETARIUM*, where it is hoped we shall be able to include those of the four newly discovered planets, some of which we have already calculated.

ORRERY, Rectification of. The orrery has heretofore been considered as a machine, serviceable only for general illustration, and in its former unimproved state its powers were certainly very limited, both as to accuracy and extent; but in the hands of a skilful instructor, the improved orreries, which, for the first time, we have now presented to the scientific world, are capable of explaining, with considerable minuteness, the principal phenomena of the Copernican system,

system, and those in the most natural way. It would lead us beyond our original intention to arrange and exemplify a systematic series of problems, that may be solved by the most improved orrery, which we hope soon to see published in a separate pamphlet; but we conceive our article will not be considered as complete without the addition of some general precepts for its rectification, that may enable its possessor to avail himself of its extensive powers in such way as may be most subservient to his purpose. We must take for granted that the proprietor of an orrery has provided himself with a screw-driver, and that he is able to take in pieces, and to put together, such parts of the machine at least as are necessary to be detached, either for package and carriage, or for adjustment; whether these parts are kept together by clamping pieces, or by close fitting by means of friction. Our precepts shall not be confined to any particular construction, but shall include what is most necessary to be done in any of the machines for giving instruction.

If we suppose the machine to be of the most comprehensive kind, the rectification of it will contain all that is requisite for rectifying any of the more limited sort, and therefore we will suppose that all the primary planets, and the Earth's and Jupiter's secondaries, are to be put to their respective situations for a given time. It has been usual to put the primary planets in the common orreries and planetaria, where the motions are *mean*, to their apparent or *equated* places, as shewn in the Nautical Almanac, or in White's Ephemeris taken from it, as though the mean and equated places were the same; whereas they never coincide, except in the perihelion and aphelion points of their respective orbits: when, there-

fore, an orrery is to be rectified for a given time, the first consideration is, whether the motions are *mean* or *equated*; if they are the former, the places of the planetary bodies, so moving, must be ascertained from the tables of mean motion respectively, which we have given, or may hereafter give, in their places, and then the respective equations of the centre, depending on their distances from their aphelion points, as exhibited in the proper tables, will give the true, apparent, or equated places, which epithets mean the same thing; but if the construction of the orrery be such, that the equated places are at all times represented by some sort of equation mechanism, then the Nautical Almanac, or White's Ephemeris, will be a ready and proper guide for rectification; though when these are neither of them at hand for the given year, the tables that give both the mean motions and equations may be substituted. In general it will be found most convenient to adjust the planetary bodies to their places for the beginning of the year, if the motions represented are *mean*, because they are given in the tables without calculation, and then turning the handle till the annual index arrives at the given day, will put all the bodies that have motion to their respective mean places for the day so indicated; but where the equated motions are produced, the rectification may be made from the almanac with equal convenience on any day of the year, that is there specified as having the heliocentric places ready calculated. For the sake of exemplification we will take the beginning of the year 1813, as the time for which an orrery, for either mean or equated motions, is required to be rectified, and the requisite places will be found, as they appear in the subjoined table; viz.

Planets.	Mean Longitude.	Aphelion.	Mean Anomaly.	Equation of the Cen.re.	Heliocentric and Equated Longitude.
Mercury - -	s ° ' " 3 8 48 36	° ' " 8 14 33 2	s ° ' " 6 24 15 34	+ s ° ' " 0 12 28 50	s ° ' " 3 21 17 26
Venus - -	6 12 15 29	10 8 46 43	8 3 28 46	+ 0 0 42 30	6 12 57 59
Earth - -	3 10 44 39	9 9 42 28	6 1 2 11	+ 0 0 2 1	3 10 46 40
Mars - -	6 20 51 44	5 2 37 48	1 18 13 56	- 0 7 22 3	6 13 29 41
Vesta - -	1 15 52 45	2 9 50 32	10 6 2 13	+ 0 7 26 0	1 23 18 45
Juno - -	11 13 52 25	7 23 17 1	3 20 35 24	- 0 29 34 0	10 14 18 25
Ceres - -	9 25 51 37	10 26 37 59	10 29 13 38	+ 0 4 14 0	10 0 5 37
Pallas - -	9 13 41 4	10 1 12 21	11 12 28 43	+ 0 6 34 0	9 20 15 4
Jupiter - -	3 26 30 38	6 11 20 39	9 15 9 59	+ 0 5 14 15	4 1 44 53
Saturn - -	9 12 8 11	8 29 18 29	0 12 49 42	0 1 20 19	9 10 47 51
Georgian - -	7 19 21 54	11 17 32 16	8 1 49 38	- 0 4 50 36	7 24 12 30
		Apogee.			
Moon - -	9 0 25 40	1 4 27 12	7 25 58 28	+ 11 22 58 18	8 23 23 58
Moon's node -					4 21 47 0

In this table the first column contains the names of the planets; the second gives the mean longitudes from the tables of the epochs; the third shews the place of the aphelion or apogee respectively; the fourth gives the difference between the second and third columns, when the latter is subtracted; the fifth contains the corresponding equation of the centre, taken from the table of mean anomalies, and the sixth shews the sum or difference of columns 2 and 5, which is the equated longitude as seen from the sun. This last column would be the same as the column of heliocentric longitudes in the almanac, if the minor equations had been attended to, as contained in the tables; but the amount of these is so small, that they may be neglected without sensible error in the adjustments of the planetary bodies, when the places are not taken from the almanac. In this manner a table may be

easily constructed for the beginning of any particular year, but let it be remembered that the epoch for the planets begin the year on December 31, 1812, but the sun (or earth) and moon on January 1, 1813, at noon, according to Lalande's tables: also that the place of the earth must be taken just six signs from that calculated for the sun from the solar tables. Whenever an orrery for mean motions is rectified it must be from column 2, and the equation in column 5 shews, by reversing the signs + and -, how much the place is before or behind the *apparent* or *true* place at the beginning of the year; as for any other time the longitude of the aphelion must be taken from the place of mean motion, for the mean anomaly, as the argument for the corresponding equation to be added or subtracted, accordingly as the quantity is more or less than six signs: but when an orrery that

that produces equated motion is used, the last column contains the proper places for the planets to be rectified by; and, when once rectified, such machine will require no further calculation for any subsequent equation, because the planets move through equal areas in equal times, as in nature. We might have added another column for the heliocentric latitude of the planets, but as these are given (except for the four newly discovered planets) in the almanac, it would be adding to the labour of constructing such table, without producing a corresponding advantage. In putting the planetary arms to the places laid down in the table, a silken thread carrying a small plummet will be useful to hold up in such way, that the eye may view it bisecting both the planetary ball and the sun, lest there should be too great a parallax in the place of the planet, when placed without such guide to its proper sign and degree. It may be unnecessary to add, that the exact place of the planet in the ecliptic circle should be covered by the thread when it bisects both the planet and sun.

When the mean motions are used, the equations of the centre may be allowed for by a joint in the perpendicular stem of the arm, and then the geocentric places may be obtained by stretching a silken thread from the earth's stem across the small ecliptic circle to any particular planet, at a given time; but in the orreries for equated motion no such manual allowance will be necessary. We will now suppose the arms adjusted to the heliocentric longitudes, mean or equated, as the case may be; and that the earth and moon want adjusting: let the moon be first put to her longitude, after the small ecliptic circle is made parallel to the outer or large one, by means of the silken thread extended over the similar divisions of both; then adjust the nodes plate, and apogeeal index, together with the lunar plate for the moon's age, tides, phases, &c. according to the calculations in the table, or places given in the almanac; after these adjustments, which should leave the centre of the moon at the same height as the centre of the earth, when the moon has no latitude, the circles of the globe must be put suitable to the latitude for which the problems are to be performed, as well as for the longitude; that is, the meridian circle must pass over the given place, and the horizon circle must have it equidistant from every part of its circumference, or, in other terms must have the said place in its pole; these circles, once fixed across one another at right angles, must not be altered till some problem is to be solved for a new latitude or longitude, or both, as the case may be; but must be suffered to revolve with the earth, care being taken that the eastern and western points of the horizon circle bisect the globe when the adjustment is finished, and also that the points of the meridian circle, in contact with the horizon circle, be at the latitude and co-latitude of the place respectively.

Adjust now the lens for converging the solar ray to the height of the earth's and moon's centres, and give it the proper focal distance, and examine that the direction of the earth's axis be parallel to a line joining the solstitial points: if these adjustments are all properly made, the luminous focal point will fall on the tropic of Cancer at midsummer, on the tropic of Capricorn at midwinter, and on the equator at the equinoxes. The proper inclination of the earth's axis will be proved by trying if the focal point will keep in the ecliptic circle of the globe from the vernal equinox to the same again, when the annual motion is given without the diurnal, while the parallelism is preserved. When these adjustments are finished, bring the meridian circle to the solar ray, and put the horary index to noon; and if both solar and sidereal time are indicated by the same dial, the distance between the two hands must be put equal to the sun's mean

right ascension at the time, and then the two hands will coincide when the sun enters Aries, which therefore is the best time for examining the relative position of the said hands. Lastly, let the week hand, the hand for Jupiter's meridian passage, and such other hands as there may be yet unadjusted, be put to their proper places, and take notice that all the motions of the hands and planets begin with the motion of the handle, as nearly as may be, which may be managed by turning till the wheels are all in action before the hands are finally placed. When all the adjustments are finished the orrery should be so placed that the pole of the earth may point towards the corresponding pole in the heavens, and then the motions of the different bodies will be referred to their corresponding places in the heavens, on each side of the earth.

With respect to the satellites of Jupiter, the table of immersions and emersions in the Nautical Almanac, or Ephemeris, will be the most convenient guide for rectification, the application of which is obvious by mere inspection. Thus, the nearest immersion of the first satellite to the beginning of the year 1813, is on the 31st of December 1812, at 9^h 38^m, and the next subsequent one on January 2, 1813, at 4^h 6^m nearly; the second has its immersion into the shadow of Jupiter on December 31, 1812, at 5^h 26^m, and again on January 3, at 18^h 44^m nearly; the third on January 1, at 16^h 46^m, and its emersion, or departure out of the shadow, at 20^h 17^m nearly; and lastly, the fourth has its immersion on January 11, at 16^h 9^m, and its emersion at 20^h 32^m, neglecting the seconds, which cannot be estimated in the orrery.

If, however, these calculations are not at hand, or if the time required is past, or future, the epochs in the tables will give the times of a mean conjunction, which may be converted readily into an apparent conjunction by applying the equations A, B, C, &c. as given in De Lambre's tables; or the equation A, depending on Jupiter's anomaly, together with the equation for the action of Jupiter in the given year, will suffice for our present purpose, without the application of the minor equations, as may be seen in the following small table.

	1 Sat.	2 Sat.	3 Sat.	4 Sat.
	D. H. M.	D. H. M.	D. H. M.	D. H. M.
1813, Epoch	0 8 43	0 3 25	1 12 15	11 3 6
Equat. A	1 51	3 8	5 43	12 35
1813, 24	4	9	18	41
Conjunction	0 10 38	0 6 42	1 18 16	11 16 22

These times of mean conjunction may be turned into apparent times by applying the equation of time as given in the Almanac, and a comparison of the results with the immersions and emersions, as given above, will shew that the times of conjunction here given are earlier than the emersions, but later than the immersions, as they should be, by reason of the continuance in the shadows respectively.

When the lamp is used for the sun, the little paper screen, at the extremity of Jupiter's arm, receives the shadows of the satellites, as well as of Jupiter himself, and the perpetual change taking place in the apparently vibratory motions to the right and left of Jupiter before and after they pass before his body, or through his shadow, affords a pleasing object of contemplation, while the exact time of each configuration is marked by the same hour index that points out the time of any other contemporary phenomenon,

phenomenon, that is taking place in any other place in the system, when all the bodies are moving together with their respective velocities, mean or equated, as the construction directs. The ring of Saturn must be set to have an inclination of about 30° with the planet's orbit, and the line of the nodes must yearly be put parallel to a diameter of the ecliptic circle taken from $5^\circ 20' 52''$ to $11^\circ 20' 52''$, in order that a spectator at the earth may see the shape of the opening between the ring and the body of the planet in any year; but when the parallelism of the ring is preserved by the mechanism, frequent adjustments are unnecessary. The planes of all the orbits of Saturn's seven satellites are nearly parallel to that of the ring, except that of the seventh, which is supposed to make an angle of about 16° with the common plane of the others. The orbits of the satellites of Georgian are supposed to be pretty nearly at right angles with the orbit of the planet, but are perhaps not sufficiently ascertained. We mention these particulars, because in the common instruments the orbits of all the secondaries are represented as being parallel to the orbits of the primaries, which representation gives a false idea of the system.

We might lastly proceed to illustrate the various phenomena arising out of the relative motions of the different heavenly bodies, by way of exemplifying the uses of the orrery; but this agreeable exercise of our time would involve us in such an endless variety of ever varying problems, that a whole volume might be filled in detailing the various combinations of motion, that constitute the subjects of astronomy, dialling, navigation, and geography; and that may be illustrated by a proper management of the orrery; particularly when the globe is large enough to admit of a quadrant of altitude to determine by measurement the altitudes and azimuths of the solar and lunar rays, or luminous points, on the surface of the globe, that indicate at all times, when the lamps are used, the vertical places of those luminaries, or the places where they would be seen through the earth's surface, supposed to be transparent, when viewed from the centre of the earth; for as the earth's surface is globular, and parallel to the apparent circle of the heavens, any measurements of angles, or of angular distances, as they regard the circles surrounding the earth, will have the same reference to these luminous points, as actual measurements would have of the sun's and moon's places seen in the heavens. Lastly, when a sphere, which has not hitherto been mentioned, but which Mr. Pearson's larger orrery has got, is fixed round the earth, on the tube of parallelism, and has a number of stars attached to it, those stars continue parallel at all times to the same stars in the heavens, and the solar and lunar rays travel from star to star, in their revolutions, and explain the occultations, and other relative appearances, together with the hour of their occurrence, and places to which they are visible, in a manner that is truly gratifying.

ORRHAGOGA, formed of *ορος*, *serum*, and *αγω*, *I draw away*, a name given by the ancients to such medicines as operated violently, as purges, and evacuated ferous and watery humours.

ORRHOPHIGION, a word used by anatomical authors, sometimes to express the extremity of the spine, but more frequently the line or seam which runs from the penis along the middle of the scrotum to the anus.

ORRHOPISSA, a name given by the ancients to the thinner or more fluid parts of tar.

ORRIA, in *Geography*, a town of Spain, in Aragon; 9 miles N. of Teruel.

ORRICE, a name given by the vulgar to the iris root.

ORRINGTON, in *Geography*, a town of America, in Hancock county, Maine, at the head of the tide on the E. side of Penobscot river, opposite to the towns of Bangor and Hamden; 32 miles northerly from Castine, and containing 785 inhabitants.

ORRIO, EL, a town of Spain, in Biscay; 15 miles S.E. of Bilbao.

ORRON WATER, a river of Scotland, which runs into the Frith of Cromarty, at Dingwall.

ORRSVILLE, a town of America, in Grainger county, and state of Tennessee; 501 miles from Washington.

ORRUS, in *Botany*, a name by which many of the ancients called the cultivated pine-tree, from its being remarkably full of juice.

The first person who has given us the name is Theophrastus; but he is followed in it not only by the other Greeks, but also by the Latins, who have called the same tree for the same reason *sapinus*, a contraction or abbreviation of the word *sapapinus*, the juicy pine. Pliny tells us, that this last was the name of the manured pitch-tree; but in this he errs; for Vitruvius, and others, tell us, that the pine nuts, *nucis pineæ*, which were eaten and used in medicine, were the fruit of the *sapapinus*, or *sapinus*; and it is evident that these must be the produce of a pine-tree, not of a pitch-tree, or any thing of the fir kind.

ORSARA, in *Geography*, a town of Naples, in Capitanata; 4 miles S. of Troja.

ORSATO, SERTORIO, in *Biography*, an eminent antiquarian, was born at Padua in the year 1617. At a very early age he exhibited a great turn for literary and scientific pursuits, and occupied himself very much in the study of ancient monuments and inscriptions. In the latter part of his life he was appointed professor of natural philosophy in the university of Padua. He died in 1678, leaving behind him many works of great erudition, as well in the Latin as in the Italian language. Of these the principal are, "Monumenta Patavina;" "Commentarius de notis Romanorum," a useful treatise respecting the marks and abbreviations used by the Romans in their writings and inscriptions; it was published in the eleventh volume of the collection of Grævius, and afterwards at Paris in 1723; "Prænomina, Cognomina, et Agnomina antiquorum Romanorum;" "Deorum, Dearumque Nomina et Attributa;" "A History of Padua," in the Italian language; also, "Poems and Orations," in Italian and Latin. He was a member of various learned societies.

ORSCHA, in *Geography, a town of Russia, in the government of Mogilev, on the Dnieper; 40 miles N. of Mogilev. N. lat. $54^\circ 30'$. E. long. $30^\circ 14'$.*

ORSERA, a sea-port town of Istria, seated on a hill, with a fine harbour, which affords shelter in tempestuous weather. It is populous, and the residence of the bishop of Parenzo; 4 miles N. of Rovigno.

ORSI, LELIO, in *Biography*, called *Lelio da Novellara*, from the chief place of his residence, after being exiled from his native city, Reggio, was by some thought to have been a pupil of Correggio, by others of Michael Angelo, because he was contemporary of both, and had something of either in his style and colour. Little remains of his works, except some frescoes in the ducal palace of Modena, and a copy of the *Notte* by Correggio, which is preserved in the palace Gazzola at Verona. He was born in 1511, and died at the age of 76.

ORSI, FRANCIS JOSEPH AUGUSTINE, a learned Italian cardinal, was born in Tuscany in 1692. In early life he embraced the monastic state in the Dominican order, and applied with such success to his studies, that he was selected to fill

the chair of theological professor. He was afterwards appointed master of the sacred palace, and at length was promoted to the high dignity of cardinal, by pope Clement XIII., in 1759. In this situation he was distinguished for modesty and simplicity of manners, and his attention was entirely occupied by his studies, and his zeal for the honour of the church. He died in 1761. He was author of "Infallibilitas Aet. Rom. Pontificis," in three vols. 4to., but he is chiefly known to posterity by his "Ecclesiastical History," in twenty vols. This work is said to be well written, but is by much too diffusive: it is in the Italian language.

ORSIERRE, in *Geography*, a town of the Valais; 5 miles S. of Martigny.

ORSINI, FULVIO, in *Biography*, an eminent scholar, was born at Rome in 1530. Being an illegitimate child, his education would have been neglected, owing to the dissensions of his parents, had not the quickness of his parts been noticed by a canon of the Lateran, (see LATERAN,) who took him under his protection, and instructed him in classical literature. On arriving at years of discretion he entered successively into the service of several cardinals of high note, by which means an opportunity was afforded him of collecting a great number of books, especially of ancient manuscripts, and employing them for the benefit of literature. He was in habits of correspondence with the most eminent literary characters of Italy, and he contributed much valuable assistance to the authors of that period. He had attained to great skill in discovering the antiquity and value of MSS., of which he was excessively proud. Cardinal Frederic Borromeo, being once in his company, requested Orsini to point out from a book that lay before them, the rules by which he distinguished ancient from modern manuscripts; upon this he immediately shut the book, and turned the discourse. He died at Rome in the year 1600, at the age of 70: he was author of several learned works, as "De Familiis Romanis;" and an Appendix to Ciaconio's treatise "De Triclinio." He caused engravings to be made of a large collection of statues, busts, and other monuments of antiquity, and published them under the title of "Imagines et Elogia Virorum illustrium et eruditorum ex antiquis lapidibus et numismatibus expressa, cum annotationibus Fulvii Ursini." In order to keep together the books which, with great labour and at vast expence he had accumulated, he bequeathed them to the Vatican. He is styled by De Thou, one of his eulogists, "Purioris antiquitatis indagator diligentissimus."

ORSINI, GAETANO, an Italian vocal performer of the early part of the last century, with a counter-tenor voice. The late Jos. Benda, first violin to Frederic II. king of Prussia, so remarkable for taste and expression on the violin, confessed to us in conversation at Berlin, that in 1723, being at Prague at only 15 years old, when the emperor Charles VI. was crowned king of Bohemia, the excellent singing which he then heard was of the utmost use to him in his subsequent studies, and particularly the performance of Gaetano Orsini, a contralto, with which he was beyond measure affected.

ORSIO, in *Geography*, a town of Sweden, in the province of Smaland; 20 miles W. of Calmar.

ORSKAIA, a town of Russia in the government of Upha, on the Ural; 132 miles E. of Orenburg.

ORSKAR, a small island on the W. side of the gulf of Bothnia. N. lat. $60^{\circ} 32'$. E. long. $18^{\circ} 11'$.

ORSOGNA, a town of Naples, in Abruzzo Citra; 9 miles S.E. of Civita di Chieta.

ORSOKO, or ORSAKI, a town of Africa, in the district of Acra, on the Gold Coast.

ORSOMORSO, a town of Naples, in Calabria Citra; 9 miles from Scalea.

ORSON'S ISLAND, an island in Penobscot river, at the N. end of Marsh's island, containing about 1000 acres. This and Orono take their names from two Indian chiefs, their respective proprietors.

ORSOVA, or ORSCHOWA, a fortress of Servia, built on both sides of the Danube; the part on the left of the river, in the bannat of Temesvar, is called Old Orsova, and was ceded to Austria by the peace of Sisto; and that on the right bank of the river, called New Orsova, belongs to the Turks. This fortress was taken by general Laudohn, since which time it has been neglected; 75 miles E. of Belgrade. N. lat. $44^{\circ} 55'$. E. long. $21^{\circ} 56'$.

ORSOY, or ORSAW, a town of France, in the department of the Roer, lately belonging to the duchy of Cleves, on the Rhine; 24 miles S.E. of Cleves. N. lat. $51^{\circ} 38'$. E. long. $6^{\circ} 35'$.

ORT, LEER-ORT, or Oort, a town of East Friesland, at the conflux of the Leer and the Ems; 11 miles S.S.E. of Emden. N. lat. $43^{\circ} 13'$. E. long. $7^{\circ} 20'$.

ORTA, a town of the Patrimonio, on the Tyber, once the see of a bishop, now united to Civita Castellana; 12 miles E.N.E. of Viterbo.—ALFO, a town of Italy, in the department of the Gogna, on a lake to which it gives name; 36 miles W.N.W. of Milan.—ALFO, a town of Spain, in Catalonia; 12 miles N.W. of Tortosa.—ALFO, a town of Naples, in the province of Capitanata; 11 miles N.N.E. of Ascoli.

ORTAKI, a town of Asiatic Turkey, in Natolia; 30 miles S.E. of Scala-nova.

OR-TCHELOSCHVEI, a town of Russia, in the government of Kolivan; 16 miles S.E. of Mungatzkoi.

ORTEGAL, a small town of Spain, in Galicia, near cape Ortegal; 13 miles from Corunna.

ORTEGAL, *Cape*, a cape on the N.W. coast of Spain, in the Atlantic ocean. N. lat. $43^{\circ} 46'$. W. long. $7^{\circ} 55'$. This is the extreme point of Spain, or the most advanced to the north of this coast: it forms a section between the Cantabrian sea and the Atlantic ocean.

ORTEGIA, in *Botany*, a genus, named by Læfing in honour of the friend and companion of his travels Joseph Ortega, whose nephew Don Casimiro Gomez de Ortega, M.D. F.R. and L.S. is the present professor of Botany at Madrid. Among the publications of this gentleman, which consist of several botanical tracts, is an account of the plants growing in the Royal Gardens at Madrid, published in numbers.—Læf. It. 112. Linn. Gen. 24. Schreb. 38. Willd. Sp. Pl. v. 1. 190. Mart. Mill. Dict. v. 3. Ait. Hort. Kew. ed. 2. v. 1. 79. Juss. 299. Lamarck Dict. v. 4. 635. Illustr. t. 29. Gært. t. 129.—Class and order, *Triandria Monogynia*. Nat. Ord. *Caryophyllæ*, Linn. and Juss.

Gen. Ch. Cal. Perianth inferior, erect, permanent, of five oval leaves, membranous at their margins. Cor. none. Stam. Filaments three, awl-shaped, shorter than the calyx; anthers linear, compressed, shorter than the filaments. Pist. Germen superior, ovate, triangular at the top; style thread-shaped, almost as long as the calyx; stigma an obtuse head. Peric. Capsule ovate, triangular in the upper part, of one cell, and three valves at the top. Seeds many, very small, oblong, acute at each end.

Ess. Ch. Calyx of five leaves. Corolla none. Capsule of one cell. Seeds numerous.

Obs. Lamarck observes that *Ortega* is chiefly distinguished from *Polycarpon* and *Læfingia* because it is destitute of a corolla.

1. *O. hispanica*. Spanish Ortega. Linn. Sp. Pl. 49. Cavan. Ic. v. 1. 35. t. 47. (*Juncaria falmanticensis*; Clus. Hist. v. 2. 174.)—Stem square, branched. Stalks many-flowered. Flowers axillary, solitary. This species was originally observed by Clusius near Salamanca, where it still grows, as well as in various other parts of Spain, flowering in summer.—*Root* perennial? round, with branched fibres at the lower part. *Stems* numerous, about a foot long, jointed; the *branches* opposite, crossing each other. *Leaves* opposite, sessile, nearly linear, erect, bright green. *Flowers* herbaceous, minute, on short stalks, so close together as to resemble a little head.

2. *O. dichotoma*. Forked Ortega. Willd. n. 2. Allion. Pedem. v. 2. 210. Miscell. Taurin. v. 3. 176. t. 4. f. 1.—Stem forked, angular. Stalks single-flowered.—Native of Piedmont, and other parts of Italy. It flowers in August and September. *Root* perennial. *Stem* erect, jointed, straight, roughish, furrowed at each end, thickish at the joints. *Leaves* opposite, linear, spreading, by no means smooth at the back. *Stipules* two, between each pair of leaves, minute, brittle-shaped, with a thickish, coloured base. *Flowers* in forked panicles, of a green colour. The habit of this species greatly resembles that of a *Galium*, whilst its structure is very near that of a *Polycarpon*.

ORTEIL, in *Fortification*. See BERME.

ORTELIUS, ABRAHAM, in *Biography*, a celebrated geographer in the sixteenth century, was born at Antwerp in the year 1527. He enjoyed the advantage of a good education, and as he had a strong inclination for literature, he made a rapid progress in his studies, and particularly excelled in the knowledge of the languages and in mathematics. So great was his skill in geographical science, that he obtained the name of the "Ptolemy of the age." With a view to improve himself in his favourite study he travelled into England, Ireland, France, Italy, and Germany, directing his enquiries to every object that was worthy of his attention, and forming a correspondence and friendship with men of learning and science in those countries. He visited Italy three times, and spent some time at Oxford in the reign of king Edward VI. In England he formed an intimacy with William Camden, who, at his request, as we are informed in the preface to the work, was engaged to undertake his Britannia. Having furnished himself with ample stores of geographical knowledge, Ortelius settled at Antwerp, where, in the year 1570, he published his "Theatrum Orbis Terrarum," which consisted of maps, accompanied with short descriptions of the several countries, and the objects in them particularly interesting to curiosity. This was the most complete work that had ever appeared, and it obtained the author a high reputation: he was almost immediately appointed to the post of geographer to Philip II. king of Spain. In the various editions called for, it underwent great improvements and enlargements, and in its most perfect state, it was published by John Baptist Urientius, in Latin, Spanish, and Italian. An epitome or abridgment of this work was published by Michael Coignet from the Plantin press. Ortelius likewise published several geographical works; among which was one entitled "Synonima Geographica," being a kind of geographical dictionary, containing short descriptions, in alphabetical order, of all the countries in the world, the mountains in those countries, islands, cities, towns, &c. This work was afterwards greatly enlarged and published under the title of "Theatrum Geographicum." In 1584 he published "Itinerarium per nonnullas Galliarum-Belgicae partes, Abrahami Ortelii et Joannes Viviani," with engravings; and in 1598 appeared "Aurei Sæculi Imago," containing a description of the man-

ners and religion of the Germans, with illustrative plates. Ortelius had collected into a museum a considerable collection of ancient statues, medals, &c. from which Francis Sweert published "Deorum, Dearumque Capita," and from the manuscripts which he left behind him, was published "Syntagma Herbarum Encomiasticum." Ortelius died at Antwerp in 1598, in the 71st year of his age. Moreri.

ORTELSBURG, in *Geography*, a town of Prussia, in the province of Oberland; 68 miles N. of Königsberg. N. lat. 53° 23'. E. long. 20° 58'.

ORTENAU, a tract of Germany, included between the Brisgau, the marquisate of Baden, the Black Forest, and the Rhine, which, in the disposition of indemnities in 1802, after the peace of Luneville, was adjudged, together with the Brisgau, to the duke of Modena, and subsequently to the duke of Baden.

ORTENBERG, a town of Germany, in the county of Hanau Munzenburg, on the Nidder; 17 miles N.E. of Frankfurt on the Maine.

ORTENBURG, a town and citadel of Bavaria, which gives name to a county. The count and inhabitants are Lutherans; 10 miles W. of Passau.—Also, a town and citadel of Carinthia, on the Drave; 32 miles W. of Clagenfurt.—Also, a town of Germany, in the Ortenau; two miles S.E. of Offenburg.

ORTH, a town of Austria; eight miles E. of Entzerstorff.

ORTHE'S, a town of France, and principal place of a district, in the department of the Lower Pyrenees; 30 miles E. of Bayonne. The place contains 6738, and the canton 14,032 inhabitants, on a territory of 192½ kilometres, in 13 communes. N. lat. 43° 29'. W. long. 0° 42'.

ORTHIA, in *Ancient Geography*, a canton of the Peloponnesus, in Arcadia.

ORTHIA, in *Mythology*, the surname of Diana, who had a temple at Lacedæmon.

ORTHIAN. The Orthian nome, in *Greek Music*, was a dactylic nome, invented, according to some, by old Olympus the Phrygian, and according to others by the Mysian. It was in singing this Orthian nome, say Herodotus and Aulus Gellius, that Arion precipitated himself into the sea.

ORTHOCERAS, in *Botany*, from *ὀρθος*, straight, and *κερας*, a horn, a genus of *Orchideæ*, separated by Mr. Brown, Prodr. Nov. Holl. v. 1. 316. from *Diuris*, on account of the more ringent flower, whose two lower calyx-leaves are straight and its petals diminutive and cohering. The only species is

O. striatum, a native of Port Jackson, New South Wales. The *bulbs* are undivided. We are inclined to refer this plant to *DIURIS*; see that article.

ORTHOCERATITES, in *Natural History*, a name by which some authors have called a species of sea-shell, found frequently fossil, but not known at present in its recent state; called by others polythalamium, and tubulus marinus concameratus. It is usually straight, but sometimes its end is twisted like the cornu ammonis. See *TUBULI Concamerati*.

ORTHOCOLON, from *ὀρθος*, straight, and *κολον*, a limb. See ANCHYLOSIS.

ORTHODORON, *ὀρθοδωρον*, an ancient Greek long measure; being the space from the carpus, or wrist, to the tips of the fingers, rated at eleven inches.

ORTHODOXY, formed from *ὀρθος*, right, and *δοξα*, opinion, judgment, a soundness of doctrine or belief, with regard to all the points and articles of faith.

According to the proper etymology of the word, orthodoxy

doxy denotes what every honest man believes his own opinions to be, in contradistinction to the opinions of others, which he rejects. In England it is vulgarly restricted to signify the opinions contained in the thirty-nine articles; and in Scotland, it is in like manner used to denote the doctrines contained in their confession of faith. It is, in general, applied to the opinions that are maintained by those called Calvinists.

Orthodoxy is used in opposition to *heterodoxy*, or *heresy*.

ORTHODOXY, or *Feast of Orthodoxy*, denotes a solemn feast in the Greek church, instituted by the empress Theodora; still held on the first Sunday in Lent, in memory of the restoration of images in churches, which had been taken down by the Iconoclasts.

ORTHODROMICS, that part of navigation which teaches the art of sailing in the arc of some great circle.

The word is Greek, *ορθοδρομια*, derived from *ορθος*, *rectus*, *straight*, and *δρομος*, *curfus*, *run*, or *distance*; *q. d.* the straight or shortest distance; and this can only be in the arc of a great circle.

ORTHOEPY, formed of *ορθος*, *right*, and *επος*, *word*, in *Grammar*, denotes the just utterance of words. For pronunciation the best rule is, says Dr. Johnson, to consider those as the most elegant speakers, who deviate least from the written words. See PRONUNCIATION.

ORTHOGONIAL, ORTHOGONIUS, in *Geometry*, denotes as much as rectangular or right-angled.

When the term is referred to a plain figure, it supposes one leg or side to stand perpendicular to the other: when spoken of solids, it supposes their axis to be perpendicular to the plane of the horizon.

ORTHOGRAPHIC *Projection of the Sphere*. See PROJECTION.

ORTHOGRAPHY, formed from *ορθος*, *right*, and *γραφή*, *writing*, in *Grammar*, the art of spelling; that is, writing words justly, and with all the proper and necessary letters. Or it is the art of combining letters into syllables, and syllables into words: or, more generally, it teaches the nature and powers of letters, or the form and sound of letters, and the just method of spelling words. Accordingly orthography makes one of the four principal divisions or branches of grammar: the other three being *etymology*, *syntax*, and *prosody*; which see respectively. Orthography, considered as the art of expressing certain sounds by proper characters, may be supposed to include *orthoepy*; which see.

That diversity found in most of the modern languages, especially the English and French, between the pronunciation and orthography, makes one of the principal difficulties in acquiring them; nevertheless it arises from the same source as the languages themselves.

The Gauls, *e. gr.* forming a new language from the ancient Latin, took the liberty to model the words to their fancy: at first, indeed, it is probable they wrote as they pronounced; but, by degrees, finding that words pronounced with all their letters sounded harsh, they began to pronounce more smoothly.

Thus, in speaking, they thought fit to soften that harshness resulting from the concurrence and clashing of consonants; but as the orthography, or writing, did not offend the ear, it still continued on its former footing.

Attempts have been since made to reduce the writing to that pronunciation, or to make us write as we speak; which has occasioned great disputes. Pelletier of Mans was the first who pleaded for the change of orthography; and after him Maigret, Peter Ramus, De Bois, Menage, and others; but in vain.

They have, however, occasioned a schism among writers,

which has done more harm than the evil they intended to reform, the French writers being since divided into two parties; one of which adheres to the *old*, the other to the *new* orthography. The latter, F. Buffier observes, is the most considerable body; yet are these divided among themselves, some being for carrying the reformation much farther than others.

The chief matters urged in behalf of the ancient orthography are, that by changing it we should lose sight of the origin and etymology of words borrowed from the Greek and Latin, &c. That it does not matter what characters are used to express sounds in writing, provided one knows the relation between those characters and the sounds they represent; that by a necessary consequence of such change, the language would, in time, be all altered, and we should lose the use of our old authors; as ours, in their turn, would likewise become unintelligible.

What is alleged for the new orthography is, its being more commodious, natural, easy, short, &c.

Some authors take a middle course between the two extremes, retrenching the letters where they are absolutely useless, as the *s* in a multitude of words; and yet studiously retaining all the letters on which the etymology has any dependence.

In the English, the orthography is more vague and uncertain than in any other language with which we are acquainted. Every author, and almost every printer, has his particular system; nay, it is scarcely so well with us as that: we not only differ from one another, but there is scarcely any one that is consistent with himself. The same word shall frequently appear with two or three different faces in the same page, not to say line. See ENGLISH.

Many schemes have been proposed for the emendation and settlement of the English orthography, which, like that of other nations, being formed by chance, or according to the fancy of the earliest writers in rude ages, was at first very various and uncertain, and is yet sufficiently irregular. Of these reformers, says Dr. Johnson, some have endeavoured to accommodate orthography better to the pronunciation, without considering that this is to measure by a shadow, to that for a model or standard which is changing while they apply it. Others, less absurdly indeed, but with equal unlikelihood of success, have endeavoured to proportion the number of letters to that of sounds, that every sound may have its own character, and every character a single sound. Such would be the orthography of a new language to be formed by a synod of grammarians upon principles of science. But who can hope to prevail on nations to change their practice, and make all their old books useless? Or what advantage would a new orthography procure equivalent to the confusion and perplexity of such an alteration? Some of these schemes are exhibited by our learned lexicographer, which, he says, may be used according to the diversities of genius, as a guide to reformers, or terror to innovators. One of the first who proposed a scheme of regular orthography was sir Thomas Smith, secretary of state to queen Elizabeth, a man of real learning, and much practised in grammatical disquisitions. After him another mode of writing was offered by Dr. Gill, the celebrated master of St. Paul's school in London. Dr. Gill, in his work entitled "*Nature and Properties of Bees, 1634*," was followed by Charles Butler, a man who did not want an understanding which qualified him for better employment. In the time of Charles I., there was a very prevalent inclination to change the orthography: as appears, among other books, in such editions of the works of Milton as were published by himself. Of these reformers, every man had his own

scheme : but they agreed in one general design of accommodating the letters to the pronunciation, by ejecting such as they thought superfluous. Some of them would have written these lines thus :

“ ————— All the erth
Shall then be paridis, far happier place
Than this of Eden, and far happier dais.”

Bishop Wilkins afterwards, in his great work of the philosophical language, proposed, without expecting to be followed, a regular orthography, by which the Lord's prayer is to be written thus :

“ Yür Fâdher hütth art in héven halloëd bi dhyi nám, dhyi cingdým cým, dhy will bi dýn in erth az it iz in héven, &c.”

We have since had no general reformers ; but some ingenious men have endeavoured to deserve well of their country, by writing *honor* and *labor*, for *honour* and *labour*, *red* for *read* in the preter tense, *sais* for *says*, *repete* for *repeat*, *explame* for *explain*, and *declame* for *declaim*. Of these it may be said, that as they have done no good, they have done little harm ; both because they have innovated little, and because few have followed them.

A popular grammarian, after observing that the orthography of the English language is attended with much uncertainty and perplexity, suggests, that a considerable part of this inconvenience may be remedied, by attending to the general laws of formation ; and for this end he presents the reader with a view of such general maxims, in spelling primitive and derivative words, as have been almost universally received. But as his valuable work is in almost every one's hands, we shall content ourselves with referring to it. See Murray's English Grammar, ed. 2. 1809, vol. i. p. 56, &c.

The orthography of a great number of English words is very far from being fixed and uniform even among writers of distinction and in the best modern publications. It would therefore be extremely desirable to have a generally approved and authoritative standard, which might serve as a directory to the doubtful, and as a kind of test for deciding differences that occur in this department of grammar. The celebrated dictionary of Dr. Johnson has occupied, and not without a very general concession, this distinguished rank in literature ; and yet some few of his decisions appear to be unwarranted by the principles of etymology and analogy. Of this dictionary, Dr. Nares, in his “ Elements of Orthoepey,” expresses a very high opinion, observing, that it has nearly fixed the external form of our language. He adds, “ indeed, so convenient is it to have one acknowledged standard to recur to ; so much preferable, in matters of this nature, is a trifling degree of irregularity, to a continued change, and fruitless pursuit of unattainable perfection ; that it is earnestly to be hoped, that no author will henceforth, on light grounds, be tempted to innovate.” Nevertheless, Mr. L. Murray has very justly observed, that this dictionary contains some orthographical inconsistencies, that ought to be rectified ; and that if these, and similar irregularities, were corrected, by spelling the words analogically, according to the first word in each part of the series, and agreeably to the general rules of spelling, the dictionary would doubtless, in these respects, be improved. Such a work, on the plan of that of Dr. Johnson, with necessary corrections and additions, is one of the desiderata in English literature ; and it is much to be regretted, that the undertaking has not yet been duly encouraged.

The ancients, who have written treatises of orthography, are Velius Longus, Marius Victorinus, Flavius Caper, Cas-

fiodorus, and Beda. Among the moderns, Torelli, Lipsius, Dausquius, Scoppa, Valla, and Manutius the younger, have treated on the same subject.

ORTHOGRAPHY, in *Geometry*, is the art of drawing, or delineating the fore-right plan or side of any object, and of expressing the heights or elevations of each part.

It is called orthography, from the Greek *ορθος*, *right*, and *γραφη*, *description*, from its determining things by perpendicular right lines falling on the geometrical plan ; or rather, because all the horizontal lines are here straight and parallel, and not oblique, as in representations of perspective.

ORTHOGRAPHY, in *Architecture*, is the elevation of a building, shewing all the parts thereof in their true proportion. The orthography is either *external* or *internal*.

ORTHOGRAPHY, *External*, is a delineation of the outer face or front of a building, exhibiting the principal wall, with its apertures, roof, ornaments, and every thing visible to an eye placed before the building.

ORTHOGRAPHY, *Internal*, called also *section*, is a delineation, or draught of a building, such as it would appear, were the external wall removed. See PERSPECTIVE.

ORTHOGRAPHY, in *Fortification*, is the profile, or representation of a work ; or a draught so conducted, as that the length, breadth, height, and thickness, of the several parts are expressed ; such as they would appear, if it were perpendicularly cut from top to bottom.

ORTHONA, in *Mythology*, a divinity worshipped at Athens, in the manner of that of Priapus.

ORTHOPNŒA, in *Medicine*, compounded of *ορθος*, *straight*, *erect*, and *πνέω*, *I breathe*, signifies that extreme difficulty of respiration, which compels the patient to sit upright in order to be able to perform the function of breathing. Orthopnœa, therefore, is not a distinct disease, but merely an extreme state of *dyspnœa*, and a symptom of several different diseases.

The reason why the erect posture is chosen, or becomes necessary in certain cases of extreme difficulty of breathing, will be obvious, if we attend to the mechanism of respiration, and to the circumstances under which orthopnœa occurs. The lungs occupy and completely fill (in a state of health) the cavity of the chest, which is bounded by a case of bone (the ribs) and muscle, and separated from the belly, internally, by a muscular curtain (the diaphragm). Now the act of breathing is performed by the enlargement of this cavity, when the external air immediately passes in, by the wind-pipe, to supply the vacuum, that would otherwise be produced ; and this enlargement or expansion of the cavity is effected partly by the elevation of the ribs, which move outwards as well as upwards, and partly by the contraction of the arch of the diaphragm downwards. In ordinary health, we can breathe by either of these modes ; for it is not necessary to distend the lungs completely at each respiration. But when, from any cause, the access of air into the lungs in sufficient quantity is impeded, it then becomes necessary to employ every means of expanding the thorax, and obtaining a sufficiency of the vital fluid. Now it must be obvious, that, in a supine posture, not only the free motion of the ribs, on which the patient lies, but also the descent of the diaphragm, will be impeded, by the pressure of the abdominal viscera against it ; so that if, with all the mechanical circumstances in his favour, he is unable to obtain a sufficient portion of air to carry on the function of the lungs, he will necessarily be reduced to extreme distress, when that supply is farther diminished by the mechanical disadvantages of a recumbent position ; and he will, therefore, be compelled to assume the erect posture, in which

which the gravity of the abdominal viscera will assist the descent of the diaphragm, and the motion of the ribs will be free.

Orthopnoea is produced in the manner just described under all circumstances, which greatly impede the act of respiration: these are, for instance, peripneumony, or inflammation of the lungs, especially when that disease is severe and dangerous; spasmodic asthma, while the paroxysm lasts, and the bronchial passages are contracted; the humoral asthma, as it has been called, in which the cells and tubes are obstructed by a congestion of mucus; and empyema, or abscess in the lungs, dropsy in the chest, tumours, and every other source of diminution of the cavity of the thorax. In some of the circumstances last mentioned, namely, when a fluid is effused into the cavity of the chest, *i. e.* between the lungs and the *parietes* of that cavity, there is an additional reason for the occurrence of orthopnoea. When an abscess of the lungs breaks, and discharges its matter into the cavity, when the lungs are wounded, and blood is discharged in like manner, or when water is effused into the sac of the *pleura*, these fluids necessarily gravitate to the most depending part, and therefore, when the body is in a supine position, they press upon the upper part of the lungs, and compress the bronchial passages; but, when the body is erect, they tend to press the diaphragm downwards, leaving the air-passages free, and conducing to the expansion of the cavity.

One practical observation, deduced from these considerations, is of importance. An ordinary observer is liable to imagine, that a person, choosing to sit up, and shunning his bed, cannot be so ill as to be near death. But in the most acute peripneumony, it will sometimes happen, that a patient will be found thus sitting by the fire, within an hour or two of his decease, because he *cannot* lie down, a situation of the utmost danger. See PERIPNEUMONY, and DYSPPNEA.

ORTHOPOGON, in *Botany*, from *ορθος*, *straight*, and *πωγων*, *a beard*, a genus of grasses, established by Mr. Brown, Prodr. Nov. Holl. v. 1. 194. It is distinguished from *Panicum* merely on account of the nearly equal size of the calyx-valves, the outermost of which has a longer awn than the other; and more especially on account of the smoothness or evenness of all the awns. The species are all tropical grasses, growing in shady places. Their *leaves* flat and broadish. *Spike* composed of alternate spikelets, directed all one way, and sometimes consisting of very few *flowers*. Four species are found in New Holland, *O. compressus*, *emulus*, *flaccidus* and *imbecillis*. The first is *Panicum compressum* of Linnæus. Mr. Brown indicates two more grasses as belonging to this genus, *P. hirtellum* of Linnæus, and *P. Burmanni* of Retzius. See PANICUM.

ORTHOSIA, or OR-TOSA, in *Geography*, a town of Syria, in the pachalic of Tripoli, on the coast of the Mediterranean; 12 miles N.E. of Tripoli. Considerable ruins indicate the site of this ancient town, which was a place of consequence, because it commanded the pass between Phœnicia and the maritime parts of Syria. It was situated to the right of the river Eleutherus, in the vicinity of that of Simyra. N. lat. 34° 47'. E. long. 35° 50'.

ORTHOSTEMON, in *Botany*, from *ορθος*, *straight*, and *σθημων*, *a flamen*. Brown Prodr. Nov. Holl. v. 1. 451.—Class and order, *Tetrandria Monogynia*. Nat. Ord. *Gen-tianeæ*, Juss.

Eff. Ch. Calyx tubular, four-toothed. Corolla with a short, deeply four-cleft limb, and naked mouth, withering. Stamens equal, prominent. Anthers bursting lengthwise, pointless, always straight. Stigmas two, roundish.

A genus of flaccid *herbs*, with broadish *leaves*, and terminal *flowers*; which its author doubtfully separates from *Canscora* of Lamarck, and from his own *Erythraea*. This last includes the *Chironia* of Fl. Brit. though perhaps it may be properly separated from the *Chironia* of Linnæus, an African shrubby genus.

ORTHOTRICHUM, from *ορθος*, *straight* or *erect*, and *τριχς*, *a hair*, which appellation alludes to the hairs that, in most species, clothe the *calyptra* or veil in this very natural genus of mosses, and whose erect position is directly the reverse of what is observable in the hairy veil of *Polytrichum*. Hedw. Crypt. v. 2. 96. Swartz Act. Holm. for 1795. 247. Sm. Fl. Brit. 1262. Turn. Musc. Hib. 92. Sims and Kon. Ann. of Bot. v. 2. 242. 532. (Weissia; Ehrh. Beitr. v. 1. 33. Schreb. 760.)—Class and order, *Cryptogamia Musci*. Nat. Ord. *Musci*.

Eff. Ch. Capsule oblong, terminal. Outer fringe of sixteen teeth; inner of eight or sixteen thread-shaped teeth, sometimes wanting. Veil angular, mostly clothed with erect hairs.

However natural this genus may be in habit, its character, as far as respects the inner fringe, is liable to the widest exceptions. Nor is the character of the hairy veil absolutely constant, some species wanting that mark, though the structure and aspect of their veil are so precisely similar to others, which are hairy, that nothing ought to disjoin them. On the other hand, the genera of *Pterogonium* and *Neckera* have a veil often clothed with the erect hairs of *Orthotrichum*; but in these the fructification is axillary, and the veil cylindrical, not angular. The late Dr. Mohr, whose loss cannot be too much lamented by cryptogamic botanists, has attempted to remove some of the difficulties above mentioned, by the establishment of a new genus, called *Ulotia*, from *ουλος*, *crisped*, which contains *Orthotrichum crispum*, amongst other species. In this he defines the veil as furnished with prominent ridges, whereas it has furrows in *Orthotrichum*. In the former the intermediate linear spaces are depressed channels, in the latter they are acute projecting edges or angles. The ridges of *Ulotia* are often cloven at their base; so are the furrows of *Orthotrichum*, which proves their analogy. A transverse section of either is a segment of a circle. (See ULOTIA.) The teeth in the outer fringe of some genuine species of *Orthotrichum* are combined in pairs, but there is always a line of distinction to indicate this union, though to a slight observer the teeth may seem to be but eight.

Orthotrichum is divided into two sections, the first comprehending such species as have the proper double fringe of the genus; the second such as want the internal fringe.

Instances of the former are

O. striatum. Common Bristle-moss. Hedw. Sp. Musc. 163. Crypt. v. 2. 99. t. 36. Engl. Bot. 2187. (*Bryum striatum*; Linn. Sp. Pl. 1579, α . *Polytrichum striatum*; Hudf. 471, α . *P. bryi ruralis facie*, capsulis sessilibus, majus; Dill. Musc. 430. t. 55. f. 8.)—Stem branched. Leaves lanceolate, keeled, revolute, spreading. Veil entire. Inner fringe of sixteen teeth.—Not rare on the trunks of old trees, bearing capsules from February to May. Few species are so complete in the technical generic characters, for this has not only a hairy *veil*, but the outer fringe consists of sixteen distinct teeth, the inner of as many white, inflexed, linear, flat, jointed, jagged ones, more like scales than bristles. The *stems* are perennial, tufted, branched, an inch or two high, clothed with crowded, spreading, lanceolate, acute, pointless, entire, revolute, single-ribbed, dark-green *leaves*, the upper ones palest, more expanded, sometimes jagged at the end. *Capsules* solitary, at the ends

of lateral shoots, projecting a little beyond the leaves, furrowed in the upper part when ripe, each on a very short *fruit-stalk*. *Lid* short, with a blunt, conical, short point, cylindrical when dry, the edge crimson. *Veil* partially covered with yellow vertical hairs. *Anthers* in axillary tufts, on a separate plant.

O. affine. Pale Straight-leaved Bristle-mofs. Schrad. Spicil. 67. Sm. Fl. Brit. n. 2. Engl. Bot. t. 1323. (*Polytrichum capfulis sessilibus, foliis brevibus rectis carinatis*; Dill. Musc. 432. t. 55. f. 10?)—Stem branched. Leaves lanceolate, keeled, revolute, spreading. *Veil* slightly crenate. Inner fringe of eight teeth.—More frequent perhaps than the foregoing, on rocks, old walls, cottage roofs, &c. It differs from that species in having paler leaves, a *fruit-stalk* more elongated as it grows older, *capsule* twisted when ripe, but especially an inner *fringe* of only eight teeth, or rather simple inflexed bristles, not jointed except when very old.

O. pulchellum. Elegant Smooth Bristle-mofs. Engl. Bot. t. 1787.—Stem somewhat branched. Leaves lanceolate, keeled, revolute, beardless, slightly twisted when dry. Inner fringe of sixteen bristles. *Capsule* with eight furrows. *Veil* naked.—Found by Mr. Winch and Mr. Thornhill, on trees in various parts of the county of Durham, since the publication of Fl. Brit. The *stems* form tufts, not half an inch high. Leaves bright green, lanceolate, acute, beardless, single-ribbed; slightly twisted, not curled, by drying. *Fruit-stalks* elongated, conspicuous above the leaves, twisted and yellowish when full-grown. *Capsule* pale when ripe, with eight furrows, and as many intermediate ridges. Outer *fringe* of sixteen elegant red teeth, partly combined in pairs; inner of sixteen very slender pale bristles, meeting by their points. *Veil* crenate at the base, destitute of hairs.

There are four more of this section natives of Britain, *O. punilum*, Engl. Bot. t. 2168; *diaphanum*, t. 1324; *aristatum*. Turn. Musc. Hib. t. 9. f. 2. (which is *diaphanum* of Dickson); and *rivulare*, Engl. Bot. t. 2188. The three last have the full number of teeth to their inner *fringe*; the first has only eight. They all grow on trees or pales, and bear a general resemblance to each other, except that *diaphanum* and *aristatum* have hoary points to their leaves.

O. crispum, Fl. Brit. n. 7. Engl. Bot. t. 996, belongs to the new genus *Ulot*, as above mentioned.

Species with a single or outer fringe only, are

O. anomalum. Rough Single-fringed Bristle-mofs. Hedw. Sp. Musc. 162. Crypt. v. 2. 102. t. 37. Engl. Bot. t. 1423. (*Bryum striatum* β; Linn. Sp. Pl. 1580. *Polytrichum bryi ruralis facie, capfulis sessilibus, minus*; Dill. Musc. 431. t. 55. f. 9. *Weissia minor*; Ehrh. Crypt. 282.)—Stem branched. Leaves lanceolate, keeled, revolute. Fringe simple. *Veil* hairy, toothed.—Common on rocks, ruins and stones, bearing fruit early in spring. The colour of the leaves is a dull brownish-green, and their edges are revolute. Though this species has no internal *fringe*, its *veil* answers to the character and name of the genus better than some of the former, being very hairy, till it becomes bald by age.

O. nudum, Engl. Bot. t. 1325, found on posts in shady places near rivers, is the only British species, of this section, besides. This is of a very dark hue, and has no hairs upon the *veil*.

O. Brownianum, Fl. Brit. n. 10. (*Grimmia Browniana*; Engl. Bot. t. 1422), a minute and very curious mof, is now found to have but four teeth to its fringe, which, in the specimens Mr. Sowerby drew, was so imperfect as to mislead his usually very accurate observation. This plant

therefore ranges in the genus *TETRAPHIS*; see that article hereafter, as well as *FRINGES of Mosses*.

ORTHORAGORISCUS, in *Ichthyology*, the name used by Rondeletius, and some other authors, for the fish more commonly known by the name of the mola, and called in English the *sun-fish*. See *TETRODON Mola*.

ORTI, in *Geography*, a town of Italy, in the Patri-monio, the see of a bishop, united to Castellana; 12 miles E. of Viterbo.

ORTIBARIO, a town of the island of Corfica; 12 miles S. of Pellegrino.

ORTIEN, the Ortian nome, or air for a flute of a very acute tone, and full of life and fire; which by animating the combatants rendered it of great use in war.

ORTIGOSA, in *Geography*, a town of Spain, in Old Castile; 14 miles S. of Logrono.

ORTIVE, *ORTIVUS*, in *Astronomy*. *Ortive*, or *eastern amplitude*, is an arc of the horizon intercepted between the point where a star rises, and the east point of the horizon, or point where the horizon and equator intersect. See *AMPLITUDE*.

ORTO, in *Geography*, a town of Chinese Tartary; 50 miles W. of Hami. N. lat. 43° 46'. E. long. 92° 44'.

ORTOLAN, in *Ornithology*. See *EMBERIZA*.

ORTON, *JOB*, in *Biography*, an eminent nonconformist divine, was born at Shrewsbury in the year 1717, where he received part of his education, which was completed under the celebrated Dr. Doddridge at Northampton. He had scarcely finished the course of his studies, when he was appointed assistant tutor in the academy. In this capacity he passed some years, and then settled as dissenting minister at Shrewsbury, his native town. He preached his first sermon here in 1741, and was ordained in the following year, and so highly was he respected by his brethren, that thirty ministers were present at the service. In 1748 his health was so bad, that he was obliged to seek for an assistant to ease him of part of his labours. Mr. Fownes was the person fixed on, and with him Mr. Orton lived in the utmost harmony and friendship till the year 1765, when he resigned the pastoral office, and in the following year he removed to Kidderminster, in order that he might benefit by the advice of Dr. Johnstone, an able and skilful physician, who was also his intimate acquaintance and friend. Here Mr. Orton spent the remainder of his days zealously intent on promoting the interests of religion. What he could not perform as a preacher, he was solicitous to effect as a practical writer. His works are the "Life of Dr. Doddridge;" "Sermons to the Aged;" "Three Sermons on Eternity;" which are exceedingly impressive, and have been translated into the Welsh language; "Three Sermons on Christian Zeal;" "Three Sermons on Christian Worship;" and some single discourses. Mr. Orton published also a volume of sermons with the title of "Religious Exercises recommended, or Discourses on the heavenly State, considered under the Idea of a Sabbath;" "Discourses on Practical Subjects," in two vols.; "Sacramental Meditations, or, Devout Reflections on various Passages of Scripture, designed to assist Christians in their Attendance on the Lord's Supper, and their immediate Improvement of it." This was his last publication. He died in the year 1783, and after his death was printed his "Practical Exposition of the Old Testament," in six vols. 8vo., which probably did not answer the public expectations formed of it; and a small collection of "Letters to a young Clergyman," which had been addressed to the Rev. Thomas Stedman, the editor, and which contained advice, that is, in general, well

well adapted for the direction and improvement of the younger clergy of every denomination.

ORTON, or *Overton*, in *Geography*, a market town and parish in the East Ward, county of Westmoreland, England, is situated in a bleak, open country, at the distance of $9\frac{1}{2}$ miles S.W. by S. from Appleby, and $27\frac{3}{4}$ N.W. by N. from London. The town is of very trifling importance, and chiefly inhabited by farmers, engaged in the cultivation of the small tract of fertile ground by which it is immediately surrounded. The church here is a large, ancient edifice, with a tower at one end. Dr. Burn, author of "The Justice of the Peace," and one of the editors of the "History and Antiquities of Westmoreland and Cumberland," was vicar of Orton upwards of thirty years. Here are two free-schools. The market is held on Friday, every week, and there are two fairs during the year. According to the population returns of 1811, this parish contains 292 houses and 1333 inhabitants. A Topographical Description of Cumberland, Westmoreland, Lancashire, &c. by John Houfman, 8vo. 1800.

ORTONA, in *Ancient Geography*, a town and port of Italy, in Samnium; it belonged to the people called Frentani, according to Strabo.

ORTONA a Mare, in *Geography*, a sea-port town of Naples, in Abruzzo Citra; the see of a bishop, united with Campali; 13 miles E. of Civita di Chieti. N. lat. $42^{\circ} 20'$. E. long. $14^{\circ} 20'$.

ORTORI, a town of Japan, in the island of Nippon; 15 miles S. of Idzumi.

ORTOSTA, a town of Sweden, in the province of Schonen; five miles N. of Lund.

ORTRAND, a town of Saxony, in the margraviate of Meissen; 22 miles N. of Dresden.

ORTYGIA, in *Ancient Geography*, a small island on the E. coast of Sicily, before Syracuse, and at the mouth of the river Alpheus. Virgil mentions it in the *Æneid*, l. iii. v. 124. This island, on which Syracuse was founded and situated between its two ports, was always very important. See SYRACUSE.

ORTYGOMETRA, DAKER-HEN, in *Ornithology*. See RALLUS Crax.

ORVAL, in *Geography*, a town of France, in the department of the Forests; five miles N. of Montmedy.

ORVALA, or ORVALLA, in *Botany*, an old name for Clary, *Salvia Sclarea*, and other species of the same genus, adopted by Dodonæus. Linnæus applies it to a species of LAMIAM; see that article.

ORUBA, in *Geography*. See ARUBA.

ORUENNY, a town of Hindoostan, in Dowlatabad; 15 miles N.N.W. of Darore.

ORVIETA, *Penitents of*. See PENITENTS.

ORVIETAN, a celebrated antidote or counter-poison; so called, because invented, and originally sold, by an operator from Orvieta, in Italy, who made experiments of it on his own person, on the public stage, by taking several doses of poisons.

In Charas's Pharmacopeia is a method of making Orvietan; where it appears, that Venice treacle is one of the principal ingredients of it.

ORVIETO, in *Geography*, a city of Italy, and capital of a province, called the "Orvietan," the see of a bishop, situated at the conflux of the Paglia and the Chiana. The cathedral is a fine Gothic building, and contains some good sculptures and paintings. The country of Orvietan is about 20 miles long, and from 10 to 15 wide; 73 miles S.S.E. of Florence. N. lat. $42^{\circ} 42'$. E. long. $12^{\circ} 3'$.

ORVILLE, JAMES PHILIP D', in *Biography*, was

born at Amsterdam in 1696, of a family originally from France. From early life he shewed an ardent attachment to letters, and afterwards travelled into various parts of Europe, visiting the libraries and cabinets and forming connections with learned men; and upon his return, in 1736, he was appointed professor of history, eloquence, and the Greek language at Amsterdam. The duties of this office he performed with high reputation about six years, when he resigned it, in order to devote himself wholly to study and literary composition. In conjunction with Burmann, he continued a work, which had been begun by some learned Englishmen, entitled "Observationes Miscellanæ Novæ," and ten volumes of it were published by them jointly, and four others were published by d'Orville separately. Some pieces of his own writing are contained in this collection, among which are "A Dissertation on the Antiquity of the Isle of Delos," and "Remarks on the Greek Romance of Chariton." He was likewise author of a learned and severe critique upon Pauw of Utrecht. He died in 1751, and after his death were published his observations on Sicily under the title of "Siculæ." Gen. Biog.

ORUM, in *Geography*, a town of Denmark, in North Jutland; 11 miles S.W. of Tyfted.

ORURILLO, a town of Peru, in the diocese of La Paz, on lake Titicaca; 25 miles N.W. of Asangaro.

ORURO, a jurisdiction of Peru, in the government of Buenos Ayres, and archbishopric of La Plata. The climate is cold, so that no vegetable will flourish; but its herds are numerous, and it has been long famous for its gold and silver mines. The former have not long since been wrought, and the latter have declined. Oruro, the capital, has, according to Alcedo, five convents and four parish churches.

ORUROS, GORUR, in *Ancient Geography*, a town of Asia, in Syria, on the banks of the Euphrates; S. of Azara, and 250 miles from Zeugma. In the time of Pompey, it was on this side the boundary of the Roman empire.

ORUS, or HORUS, in *Mythology*, a famous deity of ancient Egypt, which, as well as Osiris, was an emblem of the sun. To this purpose Plutarch says, that virtue, which presides over the sun, whilst he is moving through space, the Egyptians called Horus, and the Greeks Apollo. The veneration in which this deity was held in Egypt appears from the circumstance of three cities having been called by this name in the Thebais. The sparrow-hawk was the common emblem of Osiris and Horus, and both had sometimes the same attribute. According to the interpretation of the hieroglyphics of Heliopolis, Horus is the supreme lord and the author of time, and this evinces the propriety of representing him as the star of the day, or the sun. The Egyptians describe him under the appellation of Horapollon, as borne on lions, thus signifying his entrance into the sign of the zodiac, called the lion. Macrobius, who informs us why the Greeks gave Horus the name of Apollo, confirms this sentiment: "In the mysteries," says he, (Saturn. lib. i.) "they discover us a secret, which ought to be inviolable, that the sun, arrived in the upper hemisphere, is called Apollo." Hence we may infer, that this emblematical deity was no other than the star of day, passing through the signs of summer. Plutarch, in his "Treatise of Isis and Osiris," gives us the principal traits of the history of Horus. Accordingly he is represented as the son of Osiris and Isis; and it is said, that Typhon, after killing his brother Osiris, took possession of the kingdom, and that Horus, leaguely himself with his mother Isis, avenged the death of his father, expelled the tyrant from his throne, without depriving him of

of life, and reigned gloriously in Egypt. Diodorus, who adopts the relation of Herodotus in these particulars, adds, that the Titans having put Horus to death, his mother, who possessed the most rare secrets in medicine, even that of making him immortal, having found his body in the Nile, whither they had thrown it, restored life to it, and procured for him immortality. After this, she taught him medicine and the art of divination. With these talents, Orus rendered himself famous, and multiplied his blessings upon the world. As Apollo among the Greeks was called the Horus of the Egyptians, as to his skill both in medicine and divination, he was regarded as the same person, and called by the ancients Horus-Apollo. In all the figures of Horus which antiquity affords us in the Isiac table, and other monuments, he is always represented as a child, thus intimating that he was very young when Typhon put his father to death, and that Isis, his mother, was obliged to defer the punishment of the tyrant till her son was capable of being the instrument of her revenge. The allegory of Horus has been thus explained. The wind Khamfin makes great ravages in Egypt in the spring; by raising whirlwinds of burning sands, which suffocate travellers, darken the air, and cover the face of the sun, so as to leave the earth in perfect obscurity. This circumstance represents the death of Osiris, and the reign of Typhon. When the sun approaches the sign of the lion, he changes the state of the atmosphere, disperses these tempests, and restores the northerly winds, which drive before them the malignant vapours, and preserve in Egypt coolness and salubrity under a burning sky. This is the triumph of Horus over Typhon, and his glorious reign. As some natural philosophers have acknowledged the influence of the moon over the state of the atmosphere, they united her with this god to drive the usurper from the throne. The priests considering Osiris as the father of time, might bestow the name of his son on Horus, who reigned three months in the year.

Jablonski, who has interpreted the epithet of "Arueri," which the Egyptians gave to Horus, pretends that it signifies "efficacious virtue." These expressions perfectly characterise the phenomena which happened during the reign of this god. It is in summer, in fact, that the sun manifests all its power in Egypt. It is then that he swells the waters of the river with rains, exhaled by him in the air, and driven against the summit of the Abyssinian mountains; it is then that the husbandman reckons on the treasures of agriculture. It was natural for them to honour him with the name of "Arueri," or efficacious virtue, to mark these auspicious effects. Savary's Letters in Egypt, vol. ii. See ISIS and OSIRIS.

ORWEL, in *Geography*, a post-town of America, in Vermont; the north-westernmost in Rutland county, on the E. side of lake Champlain, containing 1376 inhabitants.

ORWELL, a river of Canada, which runs into lake Erie, N. lat. 43°. W. long. 80° 30'.—Also, a river of England, in the county of Suffolk, called "Ipswich Water," which passes by Stow, Needham, Ipswich, &c., and joining the Stour, forms the harbour of Harwich, called "Orwell Haven," and soon after discharges itself into the German sea.

ORYCTOGNOSY, that branch of mineralogy, which has for its object the classification of minerals, after well ascertained characters, and under appropriate and fixed denominations. It is the basis of all the remaining doctrines of *mineralogy*; which see. As the various mineral substances are considered separately in this work, we shall in the present article treat only on that essential part of this

doctrine which makes us acquainted with the *characters* of minerals.

The characters employed in the description of minerals are by Werner divided into five classes: 1. *External characters*, are those which are discoverable by means of the external senses, in the aggregation of fossils. 2. *Chemical or internal characters*, are those which are founded on the composition of the minerals, and are discovered by means of chemical agents and analysis. 3. *Physical characters*, are those which we derive from particular physical properties of fossils, and which are observed in the relations that fossils bear towards other substances. The most common of the physical characters is the property which some minerals possess of exhibiting signs of electricity and magnetism. Some minerals become electric by being heated, and others by friction; and the electricity thus excited is in some vitreous or positive, and in others resinous or negative. Some minerals too, and particularly some varieties of iron ore, are distinguished by being attracted by the magnet: such are magnetic pyrites and magnetic iron sand. By filing a mineral so fine, that the particles shall swim on water, and then applying a magnet, the slightest degree of magnetic effect may be observed. Among the physical properties of minerals, also, may be reckoned the phosphorescence which is produced by friction, as in some varieties of blende; or by exposure to heat, as fluor spar and some calcareous spars. To these characters also belongs the peculiar property of Lemnian earth, and some other boles, which being thrown into water split into pieces with a crackling noise, and the property of some opals and other stones, of acquiring a higher degree of transparency when they are immersed in water, hence called hydrophanes. 4. *Empirical characters*, are those which, in forming an opinion of a fossil, are deduced from the fossils with which it is found, from the circumstances under which it occurs, and from the place of its formation: these empirical characters are also known by the names of geognostic and geographic characters.

As the *external* characters, which constitute the chief subject of this article, are present in every species of fossils, and in every individual; as they are derived from the diversity in the aggregation, and are therefore indicative of the essential difference of fossils; as they may, moreover, be accurately known and defined, and easily discovered, independently of the analysis of fossils; it is evident that they are the most eligible for the purposes of *oryctognosy*. It is to the celebrated professor of Freiberg that the world is indebted for a complete treatise on this subject. (Werner *uber die äussern Kennzeichen der Fossilien*. Leipzig 1774.) In this important work the author has collected all the old and known characters, described many which he himself discovered, and given, together with accurate definitions, appropriate names to each of these characters, which are arranged by him in systematic order.

With regard to the arrangement of the external characters, it should be observed that Werner divides them into *generic* and *specific*: the former are certain properties of minerals used as characters, without any reference to their differences; such as colour, lustre, weight, &c. The differences among these properties form the *specific* characters, such as adamantine lustre, vitreous lustre, &c. The generic characters are divided into *general* and *particular*. Under the former are comprehended those that occur in all minerals; under the latter, those which occur only in particular classes of minerals. The particular generic characters are arranged according to the order in which they present themselves to the senses, as is exhibited in the following table.

TABLE

ORYCTOGNOSY.

TABLE of the Generic External Characters.

General Generic External Characters.

i. The colour.

ij. The cohesion of the particles, in relation to which fossils are distinguished into Solid, Friable, and Fluid.

Particular generic Characters of <i>solid</i> Minerals.			Particular generic Characters of <i>friable</i> Minerals.	Particular generic Characters of <i>fluid</i> Minerals.
Characters for the Sight.	External aspect	-	External shape. External surface. External lustre.	The lustre.
	Aspect of fracture	-	Lustre of the fracture. The fracture. Shape of the fragments. Shape of the distinct concretions.	
	Aspect of the distinct concretions	-	Surface of the distinct concretions. Lustre of the distinct concretion.	Transparency.
	General aspect	-	The transparency. The streak. The foiling. The hardness. The tenacity.	
	Characters for the touch	-	The fragility. The flexibility. The adhesion to the tongue.	Fluidity.
For the hearing			The found.	

Remaining general generic Characters.

- For the touch {
 iij. The unctuousity.
 iv. The coldness.
 v. The weight.
 For the smell vi. The smell.
 For the taste vii. The taste.

General generic external Characters, with their subordinate specific Characters.

I. *The Colour*.—This is not only the most obvious, but in many cases also one of the most certain external characters, and even serves as the principal distinguishing mark of many mineral substances.

1. *Principal Colours*.—These are not derived from the division of the solar ray by means of the prism, but are such as are considered simple in common life. They are

White.—Snow-white; the purest white colour, as in quartz, white lead, Carrara marble:—reddish-white, as porcelain earth, calcareous spar from Andreasberg, brown spar:—yellowish-white; in white amber, zeolite:—silver-white; native silver, arsenical pyrites, mica:—greyish-white; common quartz, granular lime-stone:—greenish-white; amianth, talc, tremolite:—milk-white; common opal, fibrous amethyst:—tin white; white cobalt ore, native antimony, native platinum.

Grey—of which smoke-grey is the characteristic or principal variety: lead grey; as in galena, grey antimony, graphite:—blueish-grey; indurated marle, hornstone, clay-slate:—pearl-grey; horn silver, common quartz, porcelain jasper:—smoke-grey; flint hornstone, Bolognese spar:—greenish-grey; clay-slate, common jasper, mica, fullers'-earth:—

yellowish-grey; iron spar, indurated marle, common clay iron-stone:—steel-grey, grey copper ore, radiated grey manganese ore:—ash-grey; basalt, wacke, some varieties of clay-slate.

Black.—Of this deep or velvet black is the purest variety:—greyish-black; basalt, black lime-stone, basaltic hornblende:—iron-black; magnetic iron sand, micaceous iron, glanz coal:—greenish or raven-black; serpentine, common hornblende, pitch-stone:—brownish or pitch-black; black blende, tin-stone, bituminous slate:—dark or velvet black; obsidian, Lydian stone, common shorl:—blueish-black; black earthy cobalt, black lead ore.

Blue.—Of this the Prussian or Berlin blue is the characteristic, or purest variety. Indigo blue; blue iron earth, sapphire, a variety of tourmaline:—Prussian blue; radiated azure copper, sapphire, rock salt:—azure blue; lapis lazuli, earthy azure copper:—violet blue; fluor-spar, amethyst, apatite:—plum blue; spinel, axinite:—lavender blue; porcelain jasper, indurated Saxon lithomarge:—smalt blue; blue iron earth, azure copper:—sky blue; feldspar of Krieglach, turquoise.

Green.—The purest of its tints is emerald green. Verdigris green; copper green, iron vitriol, fluor-spar:—selandon green; green earth of Monte Baldo, noble beryl:—mountain green; noble beryl, hornstone, actinote:—emerald green; emerald, fluor, diopside:—leek green; nephrite, prase, variety of tourmaline, augite:—apple green; chrysopras, nickel ochre:—grass green; uran mica, malachite, green lead ore:—blackish-green; serpentine, common chlorite, hornblende:—pistachio green; slaggy copper green of Salsfeld, common garnet, chrysolite:—asparagus green; chrysoberyl, asparagus stone:—olive green; olive copper ore, olivine, common garnet:—oil green;

green; beryl, pitch-stone, green lead ore, fullers' earth:—fiskin green, green lead ore, uran mica, green iron earth.

Yellow.—Of this lemon yellow is the purest tint. Sulphur yellow; native sulphur, yellow serpentine:—brass yellow; copper pyrites, pale yellow native gold:—straw yellow; calamine, yellow earthy cobalt:—bronze or bell-metal yellow; iron pyrites:—wax yellow; common opal, yellow lead ore:—honey yellow; honey stone or mellite, amber:—lemon yellow; yellow orpiment, some varieties of yellow lead ore:—gold yellow; deep yellow native gold, copper pyrites:—ochre yellow; yellow earth, calamine, ochrey brown iron-stone:—wine yellow; Saxon topaze, fluor-spar:—isabel or cream yellow; iron spar, calamine, mountain cork:—orange yellow; realgar, red lead ore (chromate of lead).

Red.—Its purest variety is carmine red. Aurora red; a variety of realgar, blende from Scharfenberg:—hyacinth red; hyacinth, garnet:—tile red; tile ore, common clay, common jasper:—scarlet red; light red cinnabar:—blood red; Bohemian garnet, light red silver ore, carnelian, common jasper:—copper red; native copper:—carmine red; filiform red copper ore from Treves, bright red cinnabar:—flesh red; feldspar, brown spar, indurated lithomarge of Rochlitz:—cochineal red; dark red copper ore, dark red cinnabar:—crimson red; noble garnet, amethyst-sapphire:—rose red; rose or milk quartz, red manganese ore, brown spar:—peach blossom red; cobalt bloom:—columbine red; noble garnet, red cobalt:—cherry red; red antimony from Braunfsdorf, red iron-froth:—brownish-red; common clay iron-stone, common jasper.

Brown.—Its most intense variety is blackish-brown. Reddish-brown; tin-stone, brown blende:—clove brown; brown iron-stone, a variety of rock crystal:—hair brown; wood tin, wood opal:—broccoli brown; zircon:—chestnut brown; Egyptian jasper, opal jasper:—yellowish-brown; common clay iron-stone, brown blende, cat's eye:—pinchbeck brown; magnetic pyrites, mica:—wood brown; mountain wood, bituminous wood, brown coal:—liver brown; brown earthy cobalt, semi-opal:—blackish-brown; mica, copper black, brown coal, &c.

2. Shade or Intensity of Colour.—Colours may be determined by the relation in which they stand to each other, with regard to intensity or shade. Thus, among the principal colours there are some which are light, such as white and yellow; and some which are dark, as blue and black. And, besides, the varieties of the principal colours differ from each other in respect to shade: thus, among the blue colours, indigo blue is dark, azure blue clear, and sky blue light; and even the varieties may afford a diversity of shade, as, for instance, clear fiskin green, light fiskin green. The peculiar shade of colour in a mineral is frequently owing to its greater or less transparency; the paleness being in proportion to the degree of transparency, and the darkness to the degree of opacity. The degree of lustre, also, in minerals produces great variety in the shade of colour.

In discriminating the shade or intensity of colour, four degrees have only in general been adopted, which are expressed by the words *dark*, *clear*, *light*, and *pale*.

3. Tarnished Colours.—By tarnish is meant a difference in the colour of the surface, after exposure to the air, from what the fresh fracture of the mineral exhibits. Some minerals are always found tarnished in their natural position in the earth, as is the case in common galena, grey antimony, and blende; some tarnish on every fresh fracture being made, as in native arsenic and copper pyrites; while others are tarnished in both cases, as in native arsenic and purple or variegated copper ore. The tarnished colours are

divided into, (a), simple tarnished colours: *viz.* grey, as in white cobalt; black, as in native arsenic; brown, as in native silver, copper pyrites; reddish, as in native bismuth; yellowish, as in white cobalt ore: and, (b), variegated tarnished colours, the varieties of which are pavonine or peacock-tail tarnish, as in copper pyrites; iridescent or rainbow tarnish, as in galena; columbine or pigeon-neck tarnish, as in bismuth; and tempered steel tarnish, as in specular iron.

4. The Play of Colours.—By this is understood the property which some minerals possess of refracting from particular spots the different rays of light. The play of colours in a mineral can only be observed in sun-shine, or in a strong light. It is remarkable in the diamond, the rock crystal, &c.

5. The mutable Reflection of Colour.—This is distinguished from the play of colours, by the mineral exhibiting in the same spot a change of colour, according to the position of its surface being varied, producing a different angle with the incident rays of light. This mutable reflection is either superficial, as in Labrador stone; or internal, as in common opal, dichroite or iolite, &c.

6. The Mutation of Colour.—This is distinguished from the tarnish, in which latter the surface only undergoes a change of colour; but in the mutation of colour, the effect penetrates the mineral, and sometimes pervades the whole. This affords two varieties: (a) the *fading* of colour, by which is meant, that the colour of a mineral becomes paler, when exposed to the light and heat, or is undergoing decomposition: thus striated red cobalt, when exposed to the air, becomes pale brownish; chrysoprase becomes light green, &c.: (b) the *perfect change* of colour is often the consequence of fading, when one colour is lost, and a new one appears, as in light coloured sparry iron-stone, and earthy grey manganese.

7. Delineations of Colours.—These are observed on simple minerals; the same specimen containing several colours which pass through its interior, according to certain delineations. Of these there are nine varieties: *viz.* dotted; when fine points of another colour are dispersed over the surface, as in a variety of serpentine:—spotted; when the points or spots are from a quarter of an inch to one inch in diameter; they are either round and regular, or irregular:—nebulous or cloudy; when the spots are large and forming the appearance of clouds, as in common calcedony, carnelian, &c.:—flamy; when the spots are large and drawn in one direction to a sharp point, as in a variety of common jasper:—striped; when narrower and broader stripes run parallel through the whole specimen:—annular; when the stripes form concentric circles, as in flints:—dendritic; when the delineation resembles the ramifications of a tree:—ruin-shaped; as in the Florentine marble:—veined; as in various marbles, serpentine, &c. Many of these seem to require no definition.

II. The Cohesion of the Particles.—According to this property, minerals are divided into solid, friable, and fluid; but these properties also belong to the particular generic characters of minerals, to be afterwards described.

Particular generic Characters of Solid Minerals.

1. The external Aspect.—In the external appearance or aspect of a mineral, three things are to be observed; the external shape, the external surface, and the external lustre.

i. The external Form.—This is divided into common, particular, regular, and extraneous external form.

1. Common external Form.—Of this a mineral is said to be when it exhibits no resemblance to any known substance in

in common life. There are six varieties of it: *viz.* massive; when a mineral is of an indeterminate form, or amorphous, or of nearly equal dimensions, from the size of a hazel-nut to the greatest magnitude:—disseminated; when a mineral, without any particular form, is in small pieces, not exceeding the size of a hazel-nut, incorporated with another solid mineral; coarsely disseminated, implies the size of a hazel-nut to that of a pea; finely disseminated, is from the size of a pea to that of a grain of millet; and minutely disseminated, from the size of a grain of millet till it is scarcely perceptible to the eye:—in angular pieces; these are either sharp cornered, as in calcedony and quartz, or blunt cornered, as in common opal:—in grains, which are either loose or imbedded; they are called large, when they are from the size of a hazel-nut to that of a pea; coarse, from the size of a pea to that of a hemp-seed; small, from the size of a hemp-seed to that of a millet-seed; and according to their form they are divided into angular and rounded grains:—in plates; distinguished into thick plates, as in red silver, and into thin plates, as in vitreous silver ore:—in membranes; these differ from the preceding in being still thinner, not exceeding the thickness of common paper.

2. *Particular external Form.*—The forms which come under this denomination exhibit a greater or less resemblance both to natural and artificial objects. They are called particular, because, like the former, they are not usual or common; they are also distinguished by the appellation of imitative forms. There are five kinds of particular external forms: *viz.* elongated, rounded, flattened, impressed, and confused: (a) *elongated*; this form has eleven varieties, *viz.* dentiform, or tooth-shaped; native silver and vitreous silver:—filiform, or thread-shaped; native silver:—capillary, or hair-shaped; native gold and silver:—reticulated, or net-shaped; native silver and copper, and a variety of galena:—dendritic, or tree-shaped; native silver and gold:—coralloid, or branched; the shape of corals, as in the beautiful variety of arragonite called flos ferri:—stalactic, or stalactitic; calcareous sinter, brown iron-stone, calcedony:—tubiform:—claviform, or club-shaped:—fruticose, or shrub-like; all these forms are observable in calcareous sinter, brown hematite, and compact manganese ore: (b) *rounded*; of which there are five varieties, *viz.* globular; this is subdivided into perfectly globular, as in pea-stone; elliptical, as in quartz and flint; amygdaloid, as in zeolite; spheroidal, as in Egyptian jasper and calcedony; and imperfectly globular, as in carnelian and calcedony:—botryoidal; resembling a bunch of grapes, as in black cobalt ore, manganese:—reniform, or kidney-shaped; as in red hematite, native arsenic, and malachite:—tuberoso, or knob-shaped; as in flint and menilite:—liquiform, or fused like melted lead; a rare variety of galena from Freiberg: (c) *flattened*; of this there are three varieties, *viz.* specular; as in galena:—in laminæ, or leaves; as in native gold:—combed, or foliated; as in quartz from Schemnitz: (d) *impressed*; of which there are six varieties, *viz.* cellular; which is subdivided according as the cells are angular or circular:—with impressions; of these the cubic, the pyramidal, the conical, the tabular, and the globular are the most remarkable:—perforated; as in swampy iron ore:—corroded; as in quartz, galena, and vitreous silver:—amorphous; surface with irregular and indeterminate inequalities, as in swampy iron ore:—vesicular; as in lavas and pumice-stone: (e) *confused*; of which there is only one variety, *viz.* ramose; as native iron and vitreous silver.

3. *Regular external Forms or Crystallizations.*—In describing crystallizations we have to consider

nine or spurious. Spurious or supposititious crystals are distinguished from genuine or true crystals by being often hollow, having a rough or drusy surface, and the solid angles or edges never sharp or well defined; examples are found in quartz of the spurious crystals of the cube and of the octahedron of fluor spar, &c.

B. *The Form of the Crystal.*—This is composed of planes; of edges formed by the junction of two planes; of plane angles; and of solid angles formed by the union of three or more planes in one point.

To determine the form of crystals it is necessary to define the fundamental figures, and then the several modifications of these forms.

a. *The Parts of the fundamental Form are*:—planes, which are either lateral or terminal; edges, which are also either lateral or terminal; and solid angles, which have been defined above.

b. *Varieties of the fundamental Form.*—They are the icosa-hedron, which is composed of twenty equilateral triangular planes; as iron pyrites:—the dodecahedron, composed of twelve regular pentagonal planes that meet under obtuse angles; as in iron pyrites and white cobalt:—the hexahedron, including the cube and the rhomb, composed of six quadrilateral planes; calcareous spar, fluor spar:—the prism, consisting of an indeterminate number of quadrangular lateral planes, terminated by two planes parallel to each other, and having each as many sides as the prism has lateral planes; calcareous spar:—the pyramid, which is composed of an indeterminate number of triangular, lateral planes, converging to a point, and of a base having as many sides as the figure has lateral planes; quartz, calcareous spar:—the table, which is composed of two lateral planes, equal and parallel, which are bounded by an indeterminate number of terminal planes; tabular barytes:—the lens, composed of two convex planes; sparry iron-stone.

c. *Differences in each fundamental Form.*—These fundamental forms differ from each other according to simplicity, number of planes, size of the planes, angles under which they meet, direction of the planes, and fullness of the crystal.

α. *Simplicity.*—This distinction is confined to the pyramid, which is either simple or double. The simple figure is also distinguished in regard of its position, which is either erect or inverted: the latter, which adheres by its summit, is scarce; in the double figure the lateral planes of the one pyramid are set either on the lateral edges, or lateral planes of the other.

β. *Number of Planes.*—The number of planes in the icosa-hedron, dodecahedron, hexahedron, and lens, is always determinate; but in the prism, pyramid, and table, it is indeterminate. The prism occurs with three, four, six, (more seldom with eight or nine), and twelve planes; the pyramid occurs with three, four, six, and eight sides; the table has four, six, or eight terminal planes.

γ. *The Size of the Planes in relation to each other.*—They are either equal or unequal, and, in the latter case, either indeterminate or determinately unequal: the varieties observed in the determinately unequal planes are the following: with planes alternately broad and narrow; with two opposite planes broader; and with two opposite planes narrower.

δ. *Angles under which the Planes meet.*—These are angles of the lateral edges, of the terminal edges, and of the summit. *Angles of the lateral edges*: these are equiangular, as in the icosa-hedron of iron pyrites; rectangular, as in galena; oblique angular, as in rhomboidal calcareous spar; unequiangular, as in topaz.—*Angles of the terminal edges*: these are either

either rectangular, as in cubic fluor; or oblique angular, which is either parallel oblique, as in the tetrahedral prism of feldspar, or alternate oblique, as in spinel, blende, and copper pyrites.—*Angles of the summit*: these are confined to the pyramid, and present the following varieties: they are called extremely acute, when the angle is from 10° to 30° , as in calcareous spar; very acute, from 30° to 50° , as in sapphire; acute, from 50° to 70° , as in calcareous spar; rather acute, from 70° to 90° , as in quartz; rectangular, as in zircon; rather obtuse, from 90° to 100° , as in honey-stone; obtuse, from 100° to 130° , as in calcareous spar; very obtuse, from 130° to 150° , as in tourmaline; extremely obtuse, from 150° to 170° .

ε. *The Direction of the Planes*.—They are either rectilinear or curvilinear: the former are the most common; the latter are distinguished according to the position of the curvature, which is either concave, as in fluor spar; convex, as in diamond; concave-convex, as in sparry iron-stone: or according to the form, which is either spherical, as in brown spar; cylindrical, in which the convexity is either parallel with the sides, as in iron pyrites, or parallel to the diagonal, as in fluor spar; and conical, as in gypsum.

ζ. *The Fullness of the Crystal*.—Crystals are either full and perfect, which is most commonly the case; or hollowed at the extremities, as in green lead ore; or entirely hollow, as the three-sided pyramidal calcareous spar from Schemnitz.

d. *Modifications of the fundamental Form*.—The changes or alterations which take place on the fundamental form are three; truncation, bevelment, and acumination.

α. *Truncation*.—This name is given to the plane which replaces an edge or a solid angle of a fundamental form. In the truncation are to be observed the parts of the truncation, *viz.* its planes, edges, and angles; and the determination of the truncation, which relates to its situation as it occurs at the edges or angles; its magnitude; its application, as being either straight, (equally inclined on the adjacent planes,) or oblique; its direction, which presents either an even or a curved surface.

β. *Bevelment*—takes place when the edges, terminal planes, or angles, are replaced each by two smaller converging planes terminating in an edge. In this we have to consider the parts and the determination of the bevelment.—The parts of the bevelment: these are the planes, the angles, and the edges; of which latter there are two kinds, *viz.* the proper edge, formed by the meeting of the two beveling planes, and the edges formed by the bevelling and the adjoining planes:—the determination of the bevelment, in which is to be considered its situation, as it takes place either at the terminal planes, or at the terminal edges, or at the angles:—its magnitude, which is said to be slight or deep; the angle under which the bevelling planes meet; the continuation of the bevelment, which is either uninterrupted or interrupted, and this latter either once interrupted, as in the double three-sided pyramid of calcareous spar, or twice interrupted, as in barytes; and lastly, the application of the bevelment, which is said to be straight, when the edge formed by the meeting of the two planes is perpendicular to the axis, and oblique, when the edge is not perpendicular to the axis of the crystal.

γ. *Acumination*.—The fundamental figure is said to be acuminate when its angles or terminal planes are replaced at least by three planes, which converge into a point, and sometimes into an edge. In this we have, as in the preceding, to attend to the parts of the acumination, and its determination, which latter relates to its situation; to the planes themselves, in which are to be observed their number, relative size, form, and application; to the angle of the summit of

the acumination, which is either obtuse and rectangular, or acute; to the magnitude of the acumination; and lastly, to its termination, which is either a point or a line.

e. *Multiplied Modifications of the fundamental Figure*.—Besides the simple alterations or modifications of the fundamental figure, we often meet with multiplied or complicated alterations. These are said to be co-ordinate, when several different kinds of alteration occur together, as truncations and bevelments; and superimposed, when several of the same kind are placed on each other, as, for instance, when one acumination is surmounted by one or more. In describing these alterations, those ought to be mentioned first which are the largest and most essential.

C. *The Connection and Aggregation of the Crystals*.—According to this, crystals are either single or aggregated. The single crystals are either loose, or imbedded, or superimposed. The aggregated crystals are either regular or irregular. To the regular or determinate belong the twin crystals, as in staurolite, and the triple crystals, which latter, however, are very rare:—many, singly aggregated, crystals are such as are either heaped upon one another, as in calcareous and fluor spars; or adhering laterally, as in amethyst crystals; or lastly, promiscuously aggregated, as in grey antimony:—many, doubly aggregated, crystals are distributed according to the form they assume, whence the following are enumerated by Werner, *viz.* scapiform or fascicular; when aggregated, acicular and capillary crystals diverge from a common centre, as in zeolite, &c.:—fasciform, manipular, or sheaflike; when a number of crystals diverge towards both ends, and are narrower in the middle, such as prehnite and radial zeolite:—columnar; elongated, equally thick prisms adhering laterally together, are of this description, as in columnar barytes:—pyramidal; many crystals parallel to one another, but of which those in the middle are the highest, and the others decline on all sides, thus giving to the aggregation a pyramidal shape, as is exemplified by calcareous spar and amethyst:—rose-like; composed of very thin tables, variously curved, and so connected together, as to resemble a full-blown rose, as is the case with the variety of calcareous spar, called rose spar, from Joachimthal:—amygdaloid; formed by tables accumulated in such a manner as to have an amygdaloid form, as in barytes:—globular; as in iron pyrites:—in rows; an aggregation in which the axes of all the crystals lie in one direction, like a string of pearls, as it is seen in calcareous spar, vitreous silver.

D. *The Magnitude of Crystals*, with regard to which they are divided into seven varieties, *viz.* uncommonly large; two feet and upwards in length, as in rock crystal:—very large; from two feet to six inches in length, as in beryl, calcareous spar:—large; from six inches to two in length:—middle-sized; from two inches to half an inch:—small; from half an inch to $\frac{1}{4}$ th of an inch:—very small; from $\frac{1}{4}$ th of an inch in length, to such as may just be distinguished by the naked eye, as in hornsilver:—microscopic; whose form cannot be distinguished by the naked eye, as in native gold, galena.

According to the relative dimensions, when compared with others, crystals are distinguished into short and low, long and high, broad and narrow, thick and thin, needle like, capillary, spicular, and globular, or tessular.

4. *Extraneous external Forms, or Petrifications*, which are divided into those of animals and those of vegetables. See PETRIFICATIONS.

ij. *The external Surface*.—This is the second particular generic character of solid minerals; the following are its varieties, *viz.* uneven; having irregular elevations and depressions, as in calcedony:—granular; when the elevations

are small, round, and nearly equal, as in stalactitical brown hematite:—drusy; having minute, prominent, equal crystals on the surface, as in quartz:—rough; when the elevations are minute, and almost imperceptible, as in quartz:—smooth:—singly streaked: crystals are streaked longitudinally, as in topaz, shorl; transversely, as in rock-crystal; diagonally, as in aplome; alternately streaked, when the transverse and longitudinal streaks occur on alternate planes, cubic iron pyrite and brown iron-stone:—doubly streaked; plumiformly doubly streaked, or like a feather, in native silver; reticularly or net-shaped, as in grey cobalt ore.

iii. *The external Lustre.*—In this third particular generic character we have to distinguish

a. *The intensity* of the lustre, of which there are five degrees, viz. splendid; the strongest kind of lustre, as in galena and selenite:—shining; as in barytes, pitch stone, copper pyrites:—glistening, or weakly shining, as in grey copper ore, porcelain, jasper, and splintery quartz:—glimmering; as in clay iron-stone, red hematite:—faintly glimmering, which may be exemplified by Lydian stone.

b. *The kind* of lustre, which is either common or metallic. The common lustre belongs chiefly to earthy stones and salts: it is vitreous or glassy; as in rock-crystal, topaz:—resinous; in pitch-stone, yellow lead ore:—pearly; in cyanite, zeolite, and selenite:—adamantine; in diamond, white lead ore:—semi-metallic; in mica, red hematite. The metallic lustre we have in copper pyrites, grey copper ore, &c.

II. *Aspect of the Fracture.*—Here, as in the external aspect, three kinds of characters present themselves, viz. the lustre of the fracture, the fracture, and the form of the fragment.

1. *The lustre* of the fracture, or the internal lustre: its determination is the same as that of the external lustre.

2. *The Fracture.* (a.) *The compact fracture*; its varieties are splintery, either coarse or fine splintery; both of which kinds of fracture occur in horn-stone, lime-stone, and quartz:—even, as in galena, Lydian stone, calcedony, chrysoprase:—conchoidal; which is distinguished, according to the size, into large and small; according to the appearance, into deep and imperfect; and according to the depth, into flat and conchoidal:—uneven; which is either coarse-grained, as in copper pyrites; or small-grained, as in copper nickel; or fine-grained, as in arsenical pyrites:—earthy; as in chalk, clay iron-stone, &c.:—hackly; in which the fracture exhibits sharp points, which is peculiar to the metals, as in native gold and native copper.

b. *The fibrous fracture*, in which are to be observed the thickness of the fibres, as they are coarse, fine, or delicate; gypsum, fine fibrous malachite, wood tin:—the direction of the fibres; which is straight, as in red hematite; or curved, as in black hematite and fibrous rock-salt:—the position of the fibres, which is promiscuous, as in plumose antimony; parallel, as in amianth; or diverging, which latter is distinguished into stellular, as in brown hematite; and scopiform, as in red hematite and malachite.

c. *The radiated fracture*, which is subdivided, according to the breadth of the rays, into uncommonly broad radiated, as in grey antimony; broad radiated, as in actinote; and narrow radiated. According to the direction of the rays; into straight radiated, and curved radiated. According to the position of the rays, into promiscuous radiated, as in grey antimony; parallel, as in hornblende; and diverging, which latter is either stellular, as in cobalt bloom; or scopiform, as in grey antimony. With regard to the aspect of the rays, we find their surface either streaked, as in hornblende, or smooth, as in actinote and antimony.

d. *The foliated fracture*, in which are to be determined

the size of the folia:—the degree of perfection of the folia, according to which the fracture is specular, as in galena; perfectly foliated; imperfectly foliated, as in fluor spar; slaty, as in clay slate; and concealed foliated, as in rock crystal:—the direction of the folia, which is straight, as in selenite, or curved foliated; this latter is subdivided into spherically curved, as in brown spar; undularly curved, as in talc; petaloidally curved, as in a variety of feldspar; and indeterminately curved, as in mica:—the position of the folia; it is either common foliated, in which the folia cover each other completely, or scaly, in which they cover each other partially, as in mica:—the aspect of the surface of the folia, which is either smooth or streaked.

e. *The Passage or Cleavage of the Folia*, which is distinguished according to the number of the cleavages into single, as in mica; double, as in feldspar, hornblende; threefold, as in calcareous spar; quadruple, as in fluor spar; and sextuple cleavage, as in blende:—according to the angle under which the cleavages intersect one another:—according to the greater or less degree of perfection of each cleavage.

Sometimes several kinds of fracture occur in one and the same mineral, so that one is contained in the other, in which case the fracture in the large is to be distinguished from the fracture in the small; thus, for instance, the fracture of clay-slate may be slaty in the large, and earthy or uneven in the small: or one fracture may traverse the other, in which case the longitudinal or principal fracture is to be distinguished from the transversal or cross fracture; thus in basaltic hornblende, the longitudinal fracture is straight foliated, while the cross fracture is small conchoidal passing into uneven, &c.

3. *The Form of the Fragments*, which is either regular or irregular; the regular are cubic fragments, as in galena, rock-salt:—rhomboidal, in which case the fragments are specular on all planes, as in calcareous spar; or specular on four sides, as in feldspar; or specular on two sides, as in selenite:—trapezoidal, as in foliated coal:—triangular-pyramidal, as in fluor spar:—dodecahedral, as in blende. The irregular fragments are cuneiform, as in wood tin, red hematite:—splintery, as in asbest, actinote:—tabular, as in mica, indurated talc:—indeterminately angular, which are most common, and are distinguished, according to the degree of sharpness which the edges of the fragments possess, into very sharp-edged, as obsidian; sharp-edged, as horn-stone; rather blunt-edged, as lime-stone; blunt-edged, as gypsum; and very blunt edged.

III. *Aspect of the distinct Concretions.*—Distinct concretions are those masses into which certain minerals are naturally divided, and which can be separated from one another without breaking through the solid or fresh part of the mineral. We consider in them

1. *The form* of the distinct concretions; it is granular, lamellar, and columnar.

a. *The granular* is distinguished, with respect to form, into round granular, which again is spherically granular, as in roe-stone; and lenticularly granular, as in red granular clay iron-stone:—angular-granular, which is either common, as in galena; or elongated, as in zeolite. With respect to magnitude, the granular distinct concretions are large granular; the size of hazel-nuts and upwards, as in galena, zeolite:—coarse-granular; from the size of a hazel-nut to that of a pea, as in blende, mica, pea-stone:—small granular; from the size of a pea to that of a millet-seed, as in galena, black blende:—fine granular; from the size of a millet-seed to just discoverable by the naked eye; iron-stone, sparry iron-stone.

b. *Lamellar*, which, with respect to direction, is straight lamellar;

lamellar; and again either quite straight, as in some varieties of galena and barytes, or fortification-like, as in amethyst:—curved lamellar, which is either indeterminate, as in specular iron; reniform, as in native arsenic; spherical-concentric, as in calcedony, and conical-concentric, as in calcareous spar. With regard to thickness, into very thick lamellar, if above $\frac{1}{2}$ an inch in thickness, as in amethyst:—thick lamellar, between $\frac{1}{2}$ and $\frac{3}{4}$ of an inch thick, as in amethyst, barytes, galena:—thin lamellar, between $\frac{1}{4}$ and $\frac{1}{2}$ of an inch, as in barytes:—very thin lamellar, varying between a line and the thickness just perceptible by the naked eye, as in native arsenic and brown spar.

c. *Columnar* denominate those distinct concretions in which the breadth and thickness are inconsiderable in comparison of the length; these, with respect to direction, are straight columnar, as in calcareous spar; and curved columnar, as in clay iron-stone. With regard to thickness, they are very thick columnar, as in quartz and calcareous spar; thick columnar, as in calcareous spar and amethyst; thin columnar, as in clay iron-stone; very thin columnar, as in amethyst, shorl. With respect to shape they are perfect columnar, when throughout of the same thickness; imperfect columnar, as in amethyst and specular iron; cuneiform columnar, as in calcareous spar and quartz. With respect to position, they are parallel columnar, as in quartz, and shorl beryl; diverging columnar, as in calcareous spar and clay iron-stone; and promiscuous columnar, as in calcareous spar and arsenical pyrites. In several minerals two of these varieties, or different sizes of the same variety of distinct concretions, occur together, either the one including the other, or the one traversing the other.

2. *The Surface of the distinct Concretions.*—This is smooth, as in hematite; rough, as in clay iron-stone; streaked, which is either longitudinally streaked, as in shorl, obliquely, as in calcareous spar, or transversely, as in amethyst; uneven, as in brown blende.

3. *The Lustre of the distinct Concretions*, which is determined in the same manner as the external lustre.

IV. *The general Aspect.*—This comprehends the transparency, the streak, and the foiling.

1. *The Transparency*, which is distinguished into transparent; which is again either simply transparent, or doubly transparent, as in calcareous spar (see REFRACTION, Double); semi-transparent, as in opal and calcedony; translucent, as in pitch-stone, granular lime-stone; translucent at the edges, as in horn-stone, heliotrope; opaque, as in chalk, &c.

2. *The Streak*, which is either of the same colour, as in chalk, or more or less different: thus crimson red cinnabar yields a scarlet-red streak; aurora red orpiment, an orange-yellow streak. Most native metals have their lustre increased by the streak.

3. *The Soiling* minerals are distinguished into such as simply soil, and this either strongly, as red scaly iron-ore; or slightly, as molybdena: and into such as both soil and mark or write, such as graphite, drawing-slate, and chalk.

V. *Characters for the Touch.*—To these Werner refers the hardness, the tenacity, the frangibility, the flexibility, and the adhesion to the tongue.

1. *The Hardness.*—This character is distinguished into extremely hard, when the file makes no impression on a mineral, such as the diamond, sapphire; very hard, when it makes a weak impression, as on topaz and rock crystal; hard, when the file makes a considerable impression, as on feldspar; semi-hard, when it may be scraped with a knife, but gives no fire with steel, as basalt, lime-stone: soft, when it is easily cut by the knife, and even yields to the nail of the finger, as gypsum and sulphur.

2. *The Tenacity.*—Its degrees are; brittle, when the particles are in the highest degree coherent and immoveable, as in quartz, grey copper ore; sectile, when the particles are coherent, but not perfectly immoveable among one another, as in galena; malleable or ductile, when the integrant particles are coherent, and also more or less moveable among one another, as in most of the native metals.

3. *The Frangibility.*—Its degrees are the following; very difficultly frangible, such as most native metals; difficultly frangible, as basalt; rather easily frangible, as flint, quartz; easily frangible, as opal; very easily frangible, as amber, &c.

4. *The Flexibility*, which is distinguished into common, as in malleable minerals, amianth, &c.; and elastic, as in mica.

5. *The Adhesion to the Tongue*, according to which minerals possess this property strongly, as hydrophane opal; rather strongly, as bole; weakly, as talc; very weakly, as clay.

VI. *Characters for the Hearing.*—*The Sound.* It is ringing or sounding, as in native arsenic; creaking, as in native amalgam when pressed with the finger; grating or rustling, as in passing the finger over mountain cork and mealy zeolite.

Particular generic Characters of Friable Minerals.—The characters included under this article are, the external form, the lustre, the appearance of the particles, the stain, and the friability.

1. *The external Form.*—According to this, friable minerals are massive, as porcelain earth; disseminated, as blue iron earth; thinly coating, as black copper ore; spurious, as scaly brown iron-stone, or brown iron froth; dendritic, as earthy and grey manganese ores. 2. *The lustre*, which is determined as in solid minerals; but friable minerals occur only as glimmering or dull: the glimmering is either common glimmering, as in indurated cobalt ochre; metallic glimmering, as in brown iron froth; pearly glimmering, as in earthy talc; dull, as in earthy cobalt ochre, &c. 3. *The aspect of the particles*, which are either dust-like, as in porcelain earth; or scaly, as in talc earth, chlorite earth. 4. *The soiling, or stain*, which is either strong, as in iron froth; or slight, as in black cobalt ochre. 5. *The friability*, with regard to which, the particles of friable minerals are either loose, that is, when they have no perceptible coherence, as in blue iron earth; or cohering, as in cobalt crust.

Particular generic Characters of Fluid Minerals.—In these Werner considers, 1. *The lustre*, which is either metallic, as in mercury; or resinous, as in petroleum. 2. *The transparency*; transparent, as in naphtha; turbid, as in petroleum; opaque, as in mercury. 3. *The fluidity*; fluid, as in mercury; viscid, as in mineral tar.

Remaining common generic external Characters.

1. *The Unctuousity*, of which there are four degrees, viz. meagre, as is the case with most minerals; rather greasy, as pipe clay; greasy, as fuller's earth and steatite; very greasy, as talc.

2. *The Coldness*, which includes three degrees, viz. cold, such as basalt, jasper, porphyry; rather cold, as serpentine gypsum; slightly cold, as amber. By this character, cut and polished stones may often be distinguished, as also real gems, from those which are artificial.

3. *The Weight.*—In order to determine with accuracy the specific gravity of minerals, a hydrostatic balance is made use of; but when this cannot be had recourse to, a mineral is examined, by lifting it in the hand, and comparing its weight, thus estimated by the feeling, with its volume, by which means an approximation may be made to its specific gravity. Five degrees of this mode of estimating the weight

of minerals have been assumed, viz. 1. Supernatant; such minerals as swim in water, as naphtha, mountain cork. 2. Light, such as have a specific gravity between 1.000 and 2.000 (taking water at 1.000); amber, mineral pitch, pit-coal. 3. Rather heavy; such as have a specific gravity between 2.000 and 4.000, which is the case with most kinds of stones, as amianthus, rock-crystal, mica, &c. 4. Heavy; when the specific gravity is from 4.000 to 6.000, as in most metallic ores, such as grey copper ore, red hematite, &c. 5. Extremely heavy; when the specific gravity exceeds 6.000, which includes the native metals, as native gold, native silver, native copper, and some others, as galena, tin-stone crystals, sulphuretted bismuth, and vitreous silver ore.

4. The *Smell*.—It is characteristic of only a small number of minerals. It is observed either of itself, without addition, and is bituminous, as in mineral pitch; slightly sulphureous, as in native sulphur and grey antimonial ore; bit-terish, as in ochre kept close shut up for some time; clayey, as in yellow chalk:—or, it is observed, after breathing on a mineral, which should be cold and breathed upon strongly and quickly, when the smell perceived is clayey bitter, as in hornblende, and some sienites:—or it is observable, after rubbing or striking, when the smell emitted is resinous, as in swine-stone after rubbing; sulphureous, as in pyrites; garlic, as in arsenical pyrites and white cobalt ore; empyreumatic, as in quartz and pitcoal.

5. The *Taste*, which is characteristic of one class of minerals only, viz. the salts; and it is sweetish saline, as rock-salt; sweetish adstringent, as native alum; sourish adstringent, as native vitriol; bitter saline, as native Epfom salt; cooling saline, as native nitre; lixivious, as native alkali; urinous, as native sal ammoniac.

ORYCTOGRAPHY, formed of ορυκτος, fossil, and γράφω, I describe, is that part of natural history in which fossils are described. See ORYCTOGNOSY.

ORYCTOLOGY, of ορυκτος, fossil, and λογος, discourse, is that part of physic which treats of fossils.

ORYGIA, in Botany, a name perverted from the barbarous Arabic one *Horudjrudi*, and applied by Forskall, in his Fl. Ægypt-Arab. 103, to a supposed new genus, established by him, upon two species of PORTULACA, or rather TALINUM. See those articles. See also Willd. Sp. Pl. v. 2. 864.

ORYGMA, ορυγμα, among the Athenians, a name given to the pit, more usually called *baralbrum*; whence the public executioner received the appellation of ὁ ἐπὶ τῷ ορυγματι.

ORYX, in Zoology, a species of Antelope. See PASAN.

ORYZA, in Botany, an ancient name, ορυζα of the Greeks, supposed by professor Martyn to be, possibly, derived from ορυσσω, to dig. Whether this name may have originally been applied to various sorts of grain, or pulse, procured by means of digging, or cultivation, the short account given by Dioscorides, decidedly indicates his ορυζα to have been our rice. "Oryza," says he, "is a kind of grain, which grows in marshy and watery places. It is moderately nutritious, and of a binding quality." Linn. Gen. 177. Schreb. 237. Willd. Sp. Pl. v. 2. 247. Mart. Mill. Dict. v. 3. Ait. Hort. Kew. ed. 2. v. 2. 317. Juss. 32. Tourn. t. 296. Lamarck Illustr. t. 264. Gærtn. t. 80.—Class and order, *Hexandria Digynia*. Nat. Ord. *Gramina*.

Gen. Ch. Cal. Glume of two minute, pointed, nearly equal valves, containing one flower. Cor. of two boat-shaped, concave, compressed valves, of equal length; the broadest with five angles, and a terminal awn; the inner one narrowest. Nectary of two minute flat leaves, at one side of

the germen, each leaf narrow at the base, abrupt at the summit, deciduous. Stam. Filaments fix, capillary, the length of the corolla; anthers cloven at the base. Pist. Germen superior, turbinate, angular; styles two, capillary, reflexed; stigmas club-shaped, feathery. Peric. none, except the corolla, which becomes firmly attached to the seed, of an oval-oblong form, compressed, with thin edges, and two furrows at each side. Seed solitary, large, oblong, obtuse, compressed, with two furrows at each side.

Eff. Ch. Calyx a glume of two valves, containing a single flower. Corolla of two valves, angular, of equal length, growing to the seed.

1. *O. sativa*. Common Rice. Linn. Sp. Pl. 475. Miller Illustr. t. 19. (Oryza; Camer. Epit. 192. Matth. Valgr. v. 1. 365. Ger. em. 79.)—Native of Ethiopia. Cultivated in tropical countries very abundantly, as well as in some of the warmer parts of Europe, in grounds for the most part artificially inundated. Gerarde had rice in his garden before 1596. It is annual, flowering in the middle of summer, and can only be kept in the stove. Root fibrous. Herb grassy, about four or five feet high, light green, smooth. Leaves linear, narrow, taper-pointed. Stipula long, abrupt, jagged, crowning the very long striated sheath. Panicle terminal, much branched, many-flowered, nearly erect, slightly spreading; its branches angular, rough. Flowers, when closed, obovate, oblique, or most gibbous at one side; their corolla somewhat hairy, curiously and minutely granulated or dotted. Awn straight, rough, various in length.

Most authors have considered this as the only species of *Oryza*. Loureiro says there are several varieties of it, and as he thinks some really distinct species, of which he gives the following particulars, to lead the way to fuller botanical observations.

1. *O. communissima*. Common Rice. Lourcir. Cochinch. 215.—Of this the stem is four feet high. Panicle spiked, the spikes mostly simple. Husk of the seed pale, oblong, with long awns. This is a late sort, gathered from six to eight months after it is sown. It inhabits marshy places; growing sickly from drought, or a slight influx of salt water; and if exposed in a great degree to either, it perishes.

2. *O. precox*. Early Rice. Ibid.—Stem three feet high. Panicle spiked, the spikes branched. Husk of the seed turgid, brownish-red; with shorter awns.—Ripens in the fourth month. Grows in marshy places, but is not injured by salt inundations.

3. *O. montana*. Mountain Rice. Ibid.—Stem as high as the last, but more slender. Husk of the seed longer; the awns extremely long. It is sown in dry mountainous situations. If exposed to a continued inundation, it decays. Sea water kills it.

Sir Joseph Banks has lately obtained seed of this valuable kind of rice, from the mountainous parts of India, where it is exposed to a considerable degree of cold. It may prove a valuable acquisition, if capable of culture in Europe.

4. *O. glutinosa*. Glutinous Rice. Ibid.—Stem four feet high. Leaves broader, and yellowish. Panicle large, with shorter awns. Seed oblong, rather large, glutinous, usually very white.—Grows both in watery and dry places. There is a variety whose seed is extremely black, and of an excellent flavour; as well as another with red seed. Loureiro.

This fourth sort appears to be what J. Miller has figured, as above quoted.

Rice seems to contain more siliceous earth in its composition, than most of its natural order.—Even the seed is not destitute of this substance. Very brilliant imitations of precious

precious stones are reported to be made of rice, for which purpose a prodigious quantity of the grain is required.—It is however a vulgar error that certain figures, cups, &c. of a whitish semitransparent hue, brought from the East, and actually carved out of soap-rock, or some such stone, are made of boiled rice.

ORYZA, in *Gardening*, contains plants of the exotic annual kind, of which the species is rice (*O. fativa*).

There are several varieties of it, namely,

The *Common Rice*, which has the culm four feet high; the panicle spikéd, the spikes commonly simple; the fruit oblong, pale, with long awns. It is late, and is cut from six to eight months after planting.

The *Early Rice* has the culm three feet high; the panicle spikéd; spikes branching; the fruit turgid, brownish-red, with shorter awns. It ripens and is cut in the fourth month from planting.

The *Dry, or Mountain Rice*, has the culm three feet high, and more slender; the fruit longish, with awns the longest of all. It is sown on mountains, and in dry soils.

The *Clammy Rice* has the culm four feet high; the leaves wider, yellowish; panicle large, with shorter awns; the seed oblong, largish, glutinous, usually very white. This is cultivated both in wet and dry places.

It varies with a black seed, which is higher flavoured, and also with a red seed.

And there are some other varieties.

Method of Culture.—These plants may be increased by seeds in the early spring. They should be sown on a hot-bed, and when the plants are come up, be transplanted into pots filled with rich light earth, and placed in pans of water, which should be plunged into a hot-bed; and as the water wastes, it must be renewed from time to time. They must be kept in the stove all the summer, and towards the end of August they will produce the grain, which will ripen tolerably well, provided the autumn prove favourable for the plants.

They afford variety in the hot-house collections.

ORYZEUM, a name given by many of the chemical writers to gold.

ORYZOPSIS, in *Botany*, from *oryza*, rice, and *opsis*, aspect or resemblance, because the plant has the habit of rice; a faulty appellation given by Michaux, contrary to the law which prohibits such compounds or comparative generic names. Michaux *Boreal-Amer.* v. 1. 51. Vahl. *Enum.* v. 2. 397.—Clas and order, *Triandria Monogynia*. Nat. Ord. *Gramina*.

Gen. Ch. *Cal.* Glume single-flowered, of two nearly equal, broadly elliptical, somewhat keeled, concave, ribbed valves, the outer one broader, and rather shorter. *Cor.* encompassed at the base with an annular tuft of hairs; its outer valve close, coriaceous, oval, somewhat cylindrical, smooth, with a terminal setaceous awn; inner concealed by the outer, much narrower, nearly linear, awnless. Nectary of two linear leaflets, the length of the germen. *Stam.* Filaments three; anthers rather prominent, long, linear, rather bearded at the point, slightly cloven at the base. *Pist.* Germen superior, oblong; style a little longer than the corolla, slender, compressed, minutely downy at the edge; stigmas two, spreading, capillary, minutely glandular, and downy. *Seed* solitary.

Eff. Ch. Calyx of two valves, single-flowered. Corolla of two valves; the outermost awned. Nectary of two linear leaves.

1. *O. asperifolia*. Michaux t. 9.—Native of the chain of mountains from Hudson's Bay to Quebec. *Stems* several, unbranched, with one or two knots; leafy at the bottom.

Lowell leaf almost as long as the stem, linear-lanceolate, acute; upper ones remote, short, narrow, flattish, rigid, rough-edged, and rather pungent, much shorter than their sheaths. *Flowers* in a racemose panicle, not numerous, resembling those of rice in general aspect, but totally unlike in structure, the calyx being most like the corolla of *Oryza*. Vahl, after Richard, describes the style as three-cleft, though the stigmas are said to be but two.

ORZERO, in *Geography*, a town of Istria, in the gulf of Venice, near the sea; 5 miles N. of Rovigno. N. lat. 45° 13'. E. long. 13° 53'.

OS, in *Anatomy*. See BONE.

Os Argenteum, in *Natural History*, the name of a species of shell-fish, of the Turbo genus. See TURBO *Argyrotomus*.

Os Aureum, the Golden Mouth, a name given to a species of the Turbo. See TURBO *Chrysofomus*.

Os Calcis, in *Anatomy*. See EXTREMITIES (*Foot*).

Os Calcis, Luxated. See LUXATION.

Os Carpi. See EXTREMITIES (*Carpus*).

Os Magnum Carpi. See EXTREMITIES (*Carpus*).

Os Claviculae. See EXTREMITIES (*Upper Extremity*).

Os Coccygis. See EXTREMITIES.

Os Cuneiforme. See EXTREMITIES.

Os Ethmoides. See CRANIUM.

Os Externum and *Internum Uteri*; the former is the front opening of the vagina; the latter, called also os tinctæ, is the aperture of the uterus in the vagina. See GENERATION.

Os Femoris. See EXTREMITIES.

Os Frontis. See CRANIUM.

Os Humeri. See EXTREMITIES.

Os Hyoides. See DEGLUTITION.

Os Ilium. See ILIUM.

Os Innominatum. See EXTREMITIES.

Os Ischii. See ISCHIUM, and EXTREMITIES.

Os Lunare. See LUNARE OS, and EXTREMITIES.

OSSA *Malarum*. See MALARIA, and CRANIUM.

OSSA *Maxillaria*. See MAXILLARIS, and CRANIUM.

OSSA *Metacarpi*. See METACARPUS, and EXTREMITIES.

Os Occipitis. See CRANIUM.

Os Orbiculare. See EXTREMITIES.

OSSA, *Nasi*. See NOSE.

OSSA, *Palati*. See PALATE, and CRANIUM.

OSSA, *Parietalia*. See PARIETALIA *Ossa*, and CRANIUM.

Os Peccoris. See STERNUM, and EXTREMITIES.

Os Pubis. See PUBIS, and EXTREMITIES.

Os Sacrum. See EXTREMITIES.

Os Sacrum, Fractured. See FRACTURE.

Os Scaphoides. See SCAPHOIDES.

Os Scapulae. See SCAPULA, and EXTREMITIES.

Os Sepie. See CUTTLE-fish-bone.

Os Sphenoides. See SPHENOIDES, and CRANIUM.

OSSA *Temporum*. See CRANIUM.

Os Tinctæ. See UTERUS, and *Os Externum*.

For other bones not above enumerated, see CRANIUM, DEGLUTITION, and EXTREMITIES. See also FRACTURE, and LUXATION.

Os, or *Oss*, in *Geography*, a town of Brabant; 10 miles N.E. of Bois-le-Duc.

OSA, a river of Etruria, which runs into the sea, N. lat. 42° 38'. E. long. 11° 12'.—Also, a town of Russia, in the government of Perm, on the Kama; 85 miles S.W. of Perm. N. lat. 56° 56'. E. long. 53° 54'.

OSA de la Vega, La, a town of Spain, in New Castile; 36 miles S. of Huete.

OSACEA, a sea-port town of Japan, in the island of Nippon,

Nippon, and, next to the two capitals Meaco and Jedo, the most considerable for wealth, munificence, and population. It is situated in a large bay, to which it gives name, near the mouth of the river Jedogawa, which is said to be here as large as the Thames at London. The port is defended by a strong castle, commanding the city and river, and always well garrisoned. Ofacea abounds with all sorts of provisions and merchandize. The neighbouring country furnishes an heath of a beautiful orange-colour, with which they cover their houses, and great quantities of which they convey to other parts of the empire for the same purpose; 25 miles S.W. of Meaco. N. lat. 35° 8'.

OSADA, a small island in the Sooloo Archipelago. N. lat. 6° 5'. E. long. 120° 28'.

OSAGE, a river of Louisiana, which runs from the W. into the right bank of the Missouri; about 24 miles from the Mississippi.

OSAGES, an Indian nation which inhabits the vicinity of the above-named river, on the right bank of the Missouri, about 80 leagues from its confluence with it. This nation numbers 2000 warriors, who occupy two settlements near each other. Their stature is gigantic and well-proportioned; they are enemies of the whites, and of all other Indian nations, and commit depredations from the Illinois to the Arkansas. The trade of this nation is said to be under an exclusive grant. The people are a cruel and ferocious race, hated and dreaded by all the other Indians.

OSARA, a town of Japan, in the island of Nippon. N. lat. 35° 10'. E. long. 136° 40'.

OSARA, *Afchara*, or *Asara*, a town of Syria, in the Desert, near the Euphrates; 170 miles E.S.E. of Aleppo.

OSBANIKET, a town of Turkestan, on the Sirr; 30 miles W. of Toucat.

OSBECKIA, in *Botany*, received its name from Linnæus, in honour of his disciple Peter Osbeck, a Swedish clergyman, who performed a voyage to China, as chaplain to a Swedish East Indiaman, and published an account of his voyage, particularly of his observations in natural history, which has been translated into German and English. The author was living, a few years since, at an advanced age, as a country clergyman in Sweden, nor have we heard of his death. He has contributed several papers on fishes, insects, and various economical plants, to the Stockholm Transactions. Linn. Gen. 186. Schreb. 249. Willd. Sp. Pl. v. 2. 300. Mart. Mill. Dict. v. 3. Ait. Hort. Kew. ed. 2. v. 2. 340. Juss. 330. Lamarck Illustr. t. 283. Gærtn. t. 126?—Class and order, *Octandria* (or rather perhaps *Decandria*) *Monogynia*. Nat. Ord. *Calycanthemæ*, Linn. *Melastomæ*, Juss.

Gen. Ch. *Cal.* perianth of one leaf, bell-shaped, permanent; limb in four or five deep, oblong, acute segments, with intermediate fringed scales. *Cor.* Petals four or five, roundish, sessile, longer than the calyx. *Stam.* Filaments eight or ten, thread-shaped, short; anthers oblong, erect, or slightly curved, each terminated by a slender beak about its own length. *Pist.* Germen ovate, closely united with the body of the calyx in the lower part, terminating above in four or five fringed scales; style cylindrical, slightly curved, the length of the stamens; stigma simple, obtuse. *Peric.* Capsule roundish-ovate, firmly clothed with the body of the calyx, (which is tubular and abrupt at the summit), of four or five cells, bursting longitudinally at the top. *Seeds* numerous, kidney-shaped. *Receptacles* lunate.

Eff. Ch. Calyx with four or five deciduous teeth, and fringed intermediate scales. Petals four or five. Anthers beaked. Capsule of four or five cells, clothed with the abrupt body of the calyx.

Obf. There is some difficulty in distinguishing this genus from *Rhexia*. Willdenow justly remarks that "the capsule of the latter is enclosed in the calyx;" but it can scarcely be said that "the germen is inferior in *Osbeckia*." It is indeed closely united with the calyx, which in some new African species is clothed with curiously fringed scales, though naked in the original Chinese one. In *Rhexia* the body of the calyx is not connected with the capsule. Perhaps, however, the permanent and simple teeth of the calyx, destitute of intermediate scales, may prove the best character of *Rhexia*. The dry capsular fruit distinguishes *Osbeckia* from *Melastoma*, to say nothing of the calyx. Linnæus in his *Prælect. in Ord. Nat. Plantarum*, 335, seems to think *Rhexia* scarcely well distinguished from *Osbeckia*, not adverting to the connection of the calyx, nor to its teeth.

* *Flowers four-cleft, with eight stamens.*

1. *O. chinensis*. Chinese *Osbeckia*. Linn. Sp. Pl. 490. Osb. Voy. English edition; 342. t. 2. Lamarck t. 283. f. a, b, c.—Body of the calyx naked; scales square, tipped with radiating bristles. Leaves linear-lanceolate, nearly sessile.—Gathered by Osbeck, on hills not far from Canton, flowering in September. The Chinese call it by a name which is equivalent to *Plume of Golden Roses*. It is sold in their apothecaries' shops, being taken in infusion for the colic, and used in fomentations for sprains and swellings. The root is woody, perennial. Stems several, branched or bushy, not above eighteen inches high, slender, square, leafy, rough, with minute close-pressed bristles. Leaves opposite, on very short stalks, linear-lanceolate, acute, entire, rounded at the base, an inch or more in length, three-ribbed, rough, with depressed bristles, as in *Melastoma*; dark green above; pale or yellowish beneath. Flowers terminal, usually two together, sessile, accompanied by ovate fringed bristles. Calyx ovate, obscurely ribbed, coloured, perfectly smooth and naked; teeth four, about as long as the body, lanceolate or oblong, at first erect, folding over each other in the form of a cone bearded at the summit, then spreading, and finally deciduous, their edges fringed with pale hairs; intermediate scales external with respect to the teeth, small, quadrangular, each crowned with a radiating tuft of unequal, pale, somewhat compound bristles, half the length of the teeth, all finally deciduous. Petals red, obovate, broad, nearly twice as long as the calyx. Anthers yellow, with a pale wavy beak. After all the other parts of the flower are fallen, the germen remains crowned with a little stalked tuft of short radiating bristles, which perhaps are the fringed scales mentioned in the generic description of that part.

2. *O. zeylanica*. Ceylon *Osbeckia*. Linn. Suppl. 215. Willd. n. 2. Ait. n. 1. Lamarck f. d. (*Echinophora maderaspatana*, *Sideritis non ferratis nervosis foliis*, fructu capsulari caucalidis æmulo; Pluk. Phyt. t. 173. f. 4.)—Bristles of the calyx palmate, three-cleft, deflexed; scales linear, tipped with radiating bristles. Leaves elliptic-lanceolate, stalked.—Native of Ceylon, from whence it was procured by sir Joseph Banks, in 1799, for Kew garden; it flowers about July in the stove, and is biennial. Root of a few small zigzag fibres. Stem solitary, a span high, slightly branched, square, with bristly angles. Footstalks about a quarter of an inch long, bristly. Leaves thinner, broader, more elliptical, and paler than in the first species, not well represented in the above figures. Flowers from one to five at the tops of the stem or branches, the lower ones on short smooth axillary stalks. Body of the calyx pale, with eight strong ribs, along which are ranged several minute scales, each bearing three widely spreading slender bristles; teeth four, oblong, single-ribbed, elegantly pectinate

minate at the edge, not so soon deciduous as in the former; scales linear, narrow, crowned with a radiant orbicular tuft of simple bristles.

Gartner's figure, marked *O. hirta*, which he thought might belong to this or the foregoing, has certainly nothing to do with either, the calyx being five-cleft, without intermediate scales, and its bristles scattered and short.

We have a specimen, gathered at Sierra Leone by the celebrated Dr. A. Afzelius, which agrees exactly with the original ones of *O. zeylanica*, except that the flowers are five-cleft and decandrous, as in all the following. We consider it nevertheless as a mere variety.

** *Flowers five-cleft, with ten stamens.*

3. *O. antennina*. Bristle-scaled Osbeckia.—Body of the calyx naked; scales linear, longer than the teeth, fringed with distant bristles. Leaves ovate, five-ribbed.—Gathered by Dr. Afzelius, at Sierra Leone. Stem branched, spreading, square, bristly. Leaves ovate, about two inches long, light green, thin, very bristly, with five ribs; their stalks about half an inch long, clothed with remarkably numerous, spreading, long, and stout bristles. Flowers situated as in both the foregoing, but larger, and on longer stalks. Body of the calyx quite smooth and naked, very obscurely ribbed, green, with a purplish tinge; teeth five, as long as the body, ovato-lanceolate, taper-pointed, pale green, tinged with purple, furnished with many fine ribs, the edges fringed with short bristles, the point tipped with a few long ones; scales rather longer than the teeth, linear, very narrow, purplish, fringed with long very distant bristles, three of which crown the summit. The petals seem to be white or yellowish.

4. *O. rotundifolia*. Round-leaved Osbeckia.—Bristles of the calyx numerous, stellated; scales linear, tipped with radiating bristles. Leaves roundish-ovate, three-ribbed.—From Sierra Leone.—The branches are reddish and hairy. Leaves about an inch long, remarkably broad, with only three ribs. Footstalks half as long, very hairy. Calyx, in the only flower we have seen, almost globose, pale, purplish; its body clothed with copious, entangled, stellated bristles; teeth five, linear-lanceolate, obtuse, recurved, half the length of the body, copiously fringed and bearded; scales linear, very like the teeth, but much narrower, the terminal bristles more radiating.

5. *O. tubulosa*. Long-necked Osbeckia.—Calyx minutely bristly; its neck tubular, elongated; body clothed with stellated bristles; scales linear, tipped with radiating ones. Leaves ovate, pointed, five-ribbed.—From Sierra Leone.—Leaves larger than in the last, of a broad-ovate, taper-pointed figure, with five ribs; both sides hairy; the under much the palest. Flowers four or five, in a loose terminal spike. Calyx ovate, with a cylindrical neck as long as the body, every part, even the teeth, densely clothed with minute, scattered, pale, yellowish, depressed bristles, besides which the body is covered with large star-like tufts of roughish, long, spreading bristles, of the same hue. Scales linear, half as long as the five teeth, but much narrower, and tipped like them with radiating brownish bristles.

6. *O. grandiflora*. Large-flowered Osbeckia.—Bristles of the calyx tufted, unequal; scales linear, short, tipped with radiating bristles; teeth four times as long, obtuse. Leaves sessile, oblong. Panicle forked.—Native likewise of Sierra Leone. A much larger plant than any of the foregoing. Stem and branches hairy. Leaves nearly or quite sessile, in distant pairs, elliptic-oblong, five-ribbed, hairy, bright green, somewhat recurved. Flowers about seven in a terminal, forked, hispid, leafless panicle, very large and handsome, purple, with yellow anthers. Bractes ovate,

obtuse, fringed, deciduous. Calyx nearly cylindrical, its body destitute of minute depressed bristles, but clothed with numerous, transverse, oblong tufts, of long unequal spreading ones; teeth five, oblong, blunt, broad, nearly as long as the body, veiny, coloured, smooth, except a fine marginal fringe, and a thick tuft of unequal terminal bristles; scales linear, a quarter the length of the teeth, smooth, crowned with an exactly similar bristly tuft. Petals, stamens, and style, about thrice as long as the calyx-teeth. This magnificent species would be a great acquisition to our stores. It appears to be herbaceous, but we have no account of its whole stature, or duration.

7. *O. multiflora*. Many-flowered Osbeckia.—Bristles of the calyx scattered, mostly simple; teeth linear, obtuse. Leaves ovate, five-ribbed, stalked. Spikes aggregate.—This also was brought from Sierra Leone. It has the habit and inflorescence of a *Melastoma*. The leaves are stalked, two or three inches long, broad-ovate, pointed, rough with depressed bristles, and furnished with five, sometimes seven, ribs; their under side palest. Spikes terminal, about three together, each simple, racemose, of from three to six flowers, bristly. We have scarcely seen the flowers, except one bud, in which the teeth of the calyx appear to be linear, smooth, with a radiating tuft of terminal bristles; the intermediate scales we have not seen, but we observe the scars where they have been, on several advanced specimens of the calyx, which is there ovate, with a shortish neck, and five marginal notches where the teeth and scales have stood. Its body is clothed with numerous, short, scattered, upright or inflexed, yellowish bristles, mostly simple, but a few towards the top are gathered into palmate tufts. The capsule is firmly coated with the body of the calyx, but the tubular neck rises altogether above it. This can hardly be Gartner's *O. hirta*, though more resembling it than any that has fallen in our way.

We trust our learned friend Afzelius, to whom we are obliged for specimens of the last five species, will pardon us for anticipating his publication of them; as our only design in doing so, after having kept them by us fifteen years, is to commemorate his discoveries, and to add fresh laurels to his distinguished countryman's fame. These new species confirm the genus and its characters, which have hitherto been so imperfectly known, that it has been in some danger of abolition. Jussieu knew *Osbeckia* merely from Linnæus, and Lamarck has advised its conjunction with *Melastoma*, the impropriety of which will sufficiently appear from all we have said. S.

OSBORN, FRANCIS, in *Biography*, an ingenious English writer, son of sir John Osborn of Chickland, Bedfordshire, was born in 1589. In early life he frequented the court, and became a retainer of the Pembroke family, and finally master of the horse to William earl of Pembroke. During the civil contentions of Charles I. he took part with the parliament, under which, and under Cromwell, he held some public employments. In the latter part of his life he resided at Oxford, in order that he might superintend the education of his son, and print some of his works. He died in February 1658—9. The work by which he is best known is his "Advice to a Son," of which the first part was printed in 1656, and the second in 1659. It consists of maxims and directions upon a variety of topics, highly important in the right conduct of life, delivered chiefly in the sententious manner. From this work, the author of the article in the *Biographia Britannica* has made large extracts, which exhibit the talents of Mr. Osborn in a striking point of view. There is, however, a certain freedom in his expressions, and in many of his sentiments, that ill-accommodated with,

with the taste of the time, and he was charged with Atheism. The vice-chancellor of Oxford was urged to cause the book to be publicly burnt, which he refused; but an order was procured to prohibit the sale of it, which, in fact, greatly increased its popularity. "This writer," says his biographer, "has been cited as giving an opinion in preference of a public education over a private one. In fact, he was sensible of what he had lost by escaping the discipline of a public school, but perhaps he did not so well compute the advantages that he had gained by the domestic plan of education; and these personal and individual consequences seem to have influenced most of those who have treated on the same subject." His other publications were various tracts upon political topics; *viz.* "Historical Memoirs on the Reigns of Queen Elizabeth and King James;" "A Miscellany of sundry Essays, Paradoxes, and problematical Discourses, Letters, and Characters; together with Political Deductions from the History of the Earl of Essex, executed under Queen Elizabeth." *Biog. Brit.*

OSBORNE, PEREGRINE, *Duke of Leeds*, was the third son of sir Thomas Osborne, bart., afterwards created baron Kiveton, viscount Latimer, and earl of Danby, by king Charles II., and raised by king William to the dignities of marquis of Carmarthen and duke of Leeds. Peregrine, the subject of this article, was called up, by writ, to the house of peers, and took his seat in that assembly on the 19th of March 1689-90, by the title of lord Osborne of Kiveton. He appears to have entered the naval service of his country in early life, to have served as volunteer on board divers ships, and was, on the 2d of January 1691, appointed commander of the Suffolk. He continued as a private captain till July 1693, having, in the intermediate time, greatly distinguished himself at the battle off La Hogue. In the early part of the year 1693, he was appointed commander of the Royal William, a first rate of a hundred guns, and on the 12th of July, of the same year, was promoted to be rear-admiral of the red. In the following year he served under lord Berkeley as rear-admiral of the blue, and requested the command of the detachment ordered to attack Brest. This was thought to be one of the most desperate undertakings ever allotted to any commander, and the steady resolution which he manifested in carrying his orders into execution, reflects on him a greater honour than could have been acquired in a less arduous undertaking by the most brilliant victory. Having shifted his flag into the Monk, he led his detachment, and saw his ships posted in the several stations assigned to them. The service was attended with the greatest danger; for they were not only very warmly received by a number of batteries of heavy cannon and mortars; but as soon as the Monk and the other ships had brought up, three heavy masked batteries, of which the assailants were perfectly ignorant, suddenly opened upon them, and rendered their utmost exertions of no avail. The commander had on this occasion a very narrow escape, a shell bursting in the ship, killing a marine who stood close to him. After his return from this unfortunate expedition, he was appointed to command the fleet which conveyed the king from Holland. In 1697 he was appointed colonel of the first regiment of marines; it does not, however, appear that he had any subsequent command, but received the regular promotions, till he attained in 1708 the highest rank in the service, *viz.* admiral and commander-in-chief of the fleet. In 1712 he succeeded his father as duke of Leeds, and died in June 1729, in the seventy-first year of his age. Sharnock's *Biographia Novalis*, vol. ii.

OSCARI, in *Geography*, a town of Sardinia; 23 miles S.E. of Castel Aragonese.

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OSCASATO, a town of Italy, in the department of the Upper Po; 12 miles N.W. of Cremona.

OSCHA, a river of Russia, which runs into the Irtisch, opposite to Melanova, in the government of Tobolsk.

OSCHATZ, or OZZEK, a town of Saxony, in the margraviate of Meissen, containing three churches, a college, and some manufactures of cloth; 16 miles N.W. of Meissen. N. lat. $51^{\circ} 18'$. E. long. $13^{\circ} 5'$.

OSCHEOCELE, from *οσχεον*, the scrotum, and *κηλη*, a swelling, in *Surgery*, a scrotal hernia. See HERNIA.

OSCHERSLEBEN, in *Geography*, a town of Westphalia, in the principality of Halberstadt, on the Bode; 10 miles N.N.E. of Halberstadt. N. lat. $50^{\circ} 2'$. E. long. $11^{\circ} 28'$.

OSCHETZKA, a town of Prussia, in the palatinate of Culm; 23 miles E. of Culm.

OSCHOPHORIA, in *Antiquity*, feasts instituted by Theseus, in acknowledgment for his having destroyed the Minotaur, and by that means freed his country, Athens, from the tribute of seven young men, who were to be sent every year into Crete, to be devoured by that monster. The word is formed from the Greek *οσχη*, branch of a vine laden with grapes, and *φειω*, I bear. Plutarch says, they were so named, because instituted by Theseus at his return to Athens, which happened to be at the time of vintage. Some say, the Ofchophoria were instituted in honour of Minerva and Bacchus, who had assisted Theseus in his enterprise. Others, that they were in honour of Bacchus and Ariadne.

To celebrate the Ofchophoria, the young people, who had fathers and mothers alive, ran to the temple of Bacchus and that of Minerva, with grapes in their hands. He, who arrived there first, was the conqueror, and was to perform the sacrifice, by pouring out of a phial a mixture of wine, honey, cheese, flour, and oil.

OSCILLA, small images of wax or clay, made in the shape of men or women; which were consecrated to Saturn, in order to render him propitious.

OSCILLATION, in *Mechanics*, vibration; or the reciprocal ascent and descent of a pendulum.

OSCILLATION, *Axis of*, is a right line, parallel to the apparent horizontal one, and passing through the centre; about which the pendulum oscillates. See PENDULUM.

M. Huygens's whole doctrine of oscillation is founded on this hypothesis, that the common centre of gravity of several bodies, connected together, must return precisely to the same height whence it fell; whether those weights return conjointly, or whether, after their fall, they return separately; each with the velocity it had then acquired.

This supposition was opposed by several, and very much suspected by others. And some, who inclined to believe it true, yet thought it too daring to be admitted into a science which demonstrates every thing.

At length M. James Bernouilli demonstrated it by strict geometry, by referring the weights to a lever; and published in the *Mem. Acad. of Scien. of Paris* for the year 1703. After his death, a more easy and natural demonstration of the centre of oscillation (see *CENTER of Oscillation*,) was advanced by his brother, and published in the *Mem. of the same Academy*, for the year 1714: the substance whereof may be conceived as follows:

A simple pendulum of a determinate length and weight, raised to a determinate height, whence it is to fall till it recovers its vertical line, employs in that fall, or demi-vibration, a determinate space of time, which can never possibly be either greater or less. Which time is necessarily such, because the agitative force, *i. e.* the force which produces

the motion of the pendulum, is determined in every thing that concurs to the formation thereof: so that it can only cause one certain effect.

The agitative force of the pendulum arises from three things: 1. The power or momentum of gravity. 2. The mass or body tied to the end of the inflexible rod. 3. The distance of that body from the point of suspension, or, which is the same, the length of the rod, or the pendulum.

Now, 1. The power of gravity, be the cause what it will, is that power, which makes a body fall, and that, *v. gr.* at the rate of $15\frac{1}{2}$ Paris feet in the first second of time. It is visible, then, that this force is the effect of a quantity, which determines those $15\frac{1}{2}$ feet, and that a heavy body would pass more or less space in the same first second, if the force of gravity were greater or less.

2. As that force is inherent in each point, or infinitely small part of a body, the greater the body is, or the larger its mass, the greater quantity of motion or force it has.

3. The distance of the moving body from the point of suspension, or the length of the rod, is always the radius of a circle, of which the moving body describes an arc; and of consequence, the greater the radius is, *ceteris paribus*, the larger arc the body describes. And, at the same time, the greater height it falls from, the greater velocity it acquires.

Now, the agitative force of the pendulum is only that of the body fastened to the end of the rod. So that it is the product of the force of the weight of the mass of that body, and of its distance from the point of suspension. The force of gravity, therefore, being always the same, and a body or weight, fastened to the end of the rod, always the same, it is impossible, that two simple pendulums, of a different length, should be so isochronal, or should make their vibrations in the same time; for by virtue of those different lengths, the velocities will be unequal, and of consequence, the times of their vibrations will be so.

But if it be supposed, that there are, in nature, different powers of gravity, it will then be possible, that two simple pendulums, of different lengths, should be isochronal; the one animated by the natural weight, the other by the imaginary one.

If the imaginary gravity or weight be greater than the natural one, the pendulum, imagined isochronal to the natural one, will necessarily describe a larger space or arc in the same time; and of consequence the weight will be fastened at a greater distance from the point of suspension. Though, to have an isochronism, the two agitative forces of the two pendulums must be equal; yet, of the three things which compose these forces, there are always two greater in the imaginary than the real pendulum: the third, therefore, *i. e.* the mass or ball, must be diminished in the necessary proportion.

As the space or arc described by the imaginary pendulum is greater than that by the natural pendulum, in the same ratio as the imaginary gravity is greater than the natural one, and a radius of that arc greater in the same ratio, are two things inseparable; the two gravities will be always to one another, as those two radii, or the two lengths of the two pendulums; which always gives the expression of the imaginary gravity, and, by a necessary consequence, that of a diminished mass or ball of the imaginary pendulum. If the power of gravity be imagined less than that of the natural one, it is easy to observe how it is to be taken; but that were needless in our design.

If now there be a compound pendulum, charged with two weights or balls fastened to the same rod, M. Ber-

noulli conceives each of those weights removed to a greater distance from the point of suspension than it was before; but both to the same; and diminished, in mass, in a due proportion: so as that both together only make one simple pendulum, animated with one weight, the expression of which is had, and isochronal to the natural compound pendulum.

Thus, we shall have one simple natural pendulum isochronal to the compound natural one, by having a simple natural pendulum isochronal to the simple imaginary pendulum before found; which is very easy: since, as the imaginary gravity is to the natural, so is the length of the simple imaginary pendulum to the length of the simple natural pendulum; and it is there the centre of oscillation is required.

We should here take notice that Mr. Taylor, a celebrated mathematician of our own country, discovered about the same time with Mr. John Bernoulli, a similar solution of this problem, and published it in his "*Methodus Incrementorum*." See PENDULUM.

OSCILLATION, *Centre of*. See CENTER of Oscillation.

OSCINES, among the Romans, an appellation given to such birds, from whose chattering or notes, omens and predictions were drawn. See ALITES.

OSCITATION, the act popularly called yawning.

OSCUA, in *Anatomy*, a term used for the orifices, or openings of the larger vessels.

OSCULATION, in *Geometry*, is used for the contact between any given curve and its osculatory circle; that is, the circle of the same curvature with the given curve. See CURVATURE.

OSCUATORY, in *Church History*, a tablet, or board, with the picture of Christ, or the blessed Virgin, or some other of the saints, which, after the consecration of the elements in the eucharist, the priest first kissed himself, and then delivered to the people for the same purpose.

OSCUATORY Circle, in *Geometry*, is used chiefly by foreign mathematicians, for the circle of curvature; that is, the circle having the same curvature with any curve at any given point. See CURVATURE.

OSCUATORY Parabola. See PARABOLA.

OSCUATORY Point, the point of contact between a curve and its osculatory circle. See CURVATURE.

OSCUUM, in *Analytical Geometry*. See CURVATURE and EVOLUTE.

OSCUUM Pacis. Anciently it was a custom in the church, that, in the celebration of mass, after the priest had consecrated the water, and spoken the words, *Pax Domini vobiscum*, the people kissed each other; which was called *osculum pacis*.

When this custom was abrogated, another arose; and, while the priests spoke the words, a deacon, or subdeacon, offered the people an image to kiss; which they called *pacem*.

OSEMANPOUR, in *Geography*, a town of Bengal; 20 miles E. of Burdwan. N. lat. $23^{\circ} 11'$. E. long. $88^{\circ} 20'$.

OSEN, a town of Norway, in the diocese of Drontheim; 56 miles N. of Drontheim.

OSENOKA, a river of Russia, which runs into the Kolia, N. lat. $64^{\circ} 15'$. E. long. $148^{\circ} 14'$.

OSER, a river of Russia, which runs into the Oka, 20 miles N.N.W. of Riazan.

OSERO, an island in the Adriatic, near the coast of Dalmatia, separated by a narrow strait from the S.W. end of the island of Cherfo; about 15 miles long, and from two to five broad. The air of this island is pestilential in the heat of summer, which is owing to pools of brackish water, that stagnate for want of an outlet, and become putrid. Their city,

city, which is well situated in the island, and which was formerly populous, is nearly ruined, and become almost uninhabitable, by an existing evil, which, if the inhabitants had not been both indolent and poor, might have been easily removed. Several good benefices are annexed to the church of Otero, which have been shamefully misapplied, instead of being employed for the relief of the inhabitants, and the improvement of the place. The cathedral of the church, in this depopulated city, is a solid fabric, with a magnificent steeple, of no mean architecture. The Saracens destroyed and burnt this place about the year 840, and it has never since been able to recover itself. The coasts of the island abound with sardines and mackrel. N. lat. $44^{\circ} 56'$. E. long. $14^{\circ} 35'$.—Alfo, a town of Dalmatia, capital of the above island, the fee of a bishop, suffragan of Zara.

OSFAN, or ASFAN, a town of Arabia, in the province of Hedsjas; 35 miles N.N.W. of Mecca.

OSIANDER, ANDREW, in *Biography*, was a native of Bavaria, and born in 1498. He studied at Wittenburg and Nuremberg, and was one of the earliest disciples of Luther, and, like his master, frequently declaimed with great applause and success against the corruptions of religion as introduced into the papal system of doctrine and worship. Nor did he stop here, but most zealously supported the reformer in his attacks on the power and jurisdiction of the Roman pontiff, and in his efforts to establish a faith and discipline more consonant with the principles and precepts of the gospel than those of Rome. From this time he had a considerable share in the controversies and conferences which were held on the subject of religion. He took an active part at the conference of Marburg in 1529, between Luther and the Swiss divines, on which occasion, however, he shewed that he thought and acted for himself; he spoke, after Luther, upon the subject of Justification, and maintained doctrines very dissimilar from his. He was appointed minister and professor at Konigsberg, where he became distinguished for his peculiar notions on the subject of Justification, which he said was effected in us by the union of God with our souls. This doctrine was opposed by many eminent doctors of the Lutheran church, but Osiander was not to be deterred by any human authority, and justified himself with spirit, acuteness, and powerful talents, and his sentiments were supported by persons of considerable weight. He drew up a confession of faith, which was printed by order of the duke of Brandenburg, but highly disapproved by the Lutheran divines assembled at Augsburg. While he was preparing to maintain his doctrines, and to crush his opponents, he was attacked with an epileptic disorder, which terminated his life in 1552. He wrote "Harmonia Evangelica;" "Epistola ad Zuinglium de Eucharistia;" "Disertationes duæ, de Lege et Evangelio et Justificatione;" "Liber de Imagine Dei, quid sit." He had a son Luke who was a Lutheran minister, and wrote an institution of the Christian religion, and other works, and who died at Tubingen in 1604; and there was another person named Luke Osiander, who was chancellor of Tubingen, who died in 1638, and who left behind him a treatise "On the Omnipresence of Christ as Man."

OSIANDER, ANDREW, grandson of the Andrew above-mentioned, was born at Blauberger, in the duchy of Wirtemberg, in 1562, and became a Lutheran minister. He was distinguished for his early genius, and attachment to letters, passing through the different courses of academical study, with the most honourable testimonials from his superiors. In 1584 he was appointed deacon of the church of Aurach; whence he removed in 1586, and was made pastor of the church of Gigligen. Afterwards he was appointed preacher

and counsellor to prince Lewis of Wirtemberg, and in 1592 he received the degree of doctor of divinity in the new ducal university of Tubingen. In the year 1598, prince Frederic nominated him abbot of Adelberg, and superintendent of the churches in that district. In 1605 he became pastor of the church of Tubingen, and was installed chancellor of the university in that place. He died in 1617. He was the editor of "Biblia Sacra, Latine vulgata, cum Emendationibus et Explicationibus superiorum Versionum, et Observationibus ex Theol. Andreæ, Herbrandi," which passed through five editions in a few years, and is highly commended by father Simon, in his Crit. Hist. of the Old Testament. He was likewise author of several theological works.

OSIANDER, JOHN ADAM, a Lutheran divine and professor, was a native of Vayingen, in the duchy of Wirtemberg, and was a provost of the university of Tubingen, where he died in the year 1697. He is known as the author of "Commentarius in Pentateuchum," in five volumes, folio; also of Commentaries on Joshua, the book of Judges, Ruth, and the two books of Samuel; of "Disertationes Academicæ in præcipua et maxime controversa Novi Testamenti Loca," and other learned works.

OSIANDRIANS, in *Ecclesiastical History*, a sect among the Lutherans so called from Andrew Osiander, a celebrated German divine.

Their distinguishing doctrine was, that a man is justified formally, not by the faith and apprehension of the justice of Jesus Christ, or the imputation of our Saviour's justice, according to the opinion of Luther and Calvin; but by the essential justice of God.

OSIANDRIANS, *Semi*, were such among the Osiandrians, as held the opinion of Luther and Calvin with regard to this life; and that of Osiander, with regard to the other; asserting, that man is justified here by imputation; and hereafter by the essential justice of God.

OSICA, in *Geography*, a town of Poland, in the palatinate of Sandomirz; eight miles S.W. of Lucko.

OSIER, in *Botany*. See SALIX.

OSIER, in *Planting*, a particular sort of willow which is often planted in moist boggy situations on the borders of rivers, for the use of the shoots in basket-making and other purposes.

The following are the names and uses of the species which are employed in the vicinity of Brentford, as stated in the Middlesex Report:

"1. The *Salix vitallina*, or yellow willow, which is cultivated chiefly by the nurserymen, and being of a tough yielding nature, is used for binding packages of trees and shrubs in the drawing season, and for tying up the branches of wall and espalier trees.

"2. The *Salix amygdalina*, or almond-leaved willow, which is a species of which there are several varieties, one of which is called by the planters 'the small red willow,' or 'binding rod;' it being chiefly used for binding the produce of garden-grounds. Another kind of this willow is at present known by the loose appellation of the 'new kind;' it is of large growth, and produces a great crop; is used both by the basket-makers and the corn sieve-makers, and is fit for any work which requires a firm as well as a tough rod.

"3. The *Salix viminalis*, or osier willow. Of this species there are also several varieties, which are called among the planters by the name of 'the yellow and brown osiers,' or 'Coomb's osiers.' They are chiefly used by the basket-makers, being very pleafant working rods, and, as they produce a great crop, are much cultivated.

"These three descriptions comprehend the most useful varieties, and the most profitable in point of crop, of any that are cultivated in that district. There is, however, a coarse sort of willow, known by the name of 'the Spaniard;' but whether it is a distinct species or not is not decided; it might be rendered extremely useful in counties where much brush or underwood is bound."

Mr. Young says "February is the proper time to plant osiers and other sorts of willows. No part of the farmer's business pays better than such plantations, especially if he has any low, spongy, boggy bottoms near a stream. The land should be formed by spade-work into beds, six, eight, or ten feet broad, by narrow ditches; and if there is a power of keeping water in these cuts at pleasure by a sluice, it is in some seasons very advantageous to do so." John Phillips, esq. of Ely, states in the sixteenth volume of the Transactions of the Society of Arts, &c. that he has "made many experiments on different soils, with the view of ascertaining which are most appropriate to osier plantations; and which, of the almost infinite variety of osiers, are best adapted to the different soils; but as his plantations are chiefly in the fens, he has directed his attention more particularly to determine what species of osiers are most profitable in a black peat soil, and which is the most advantageous way of planting them, and at what season of the year. It would have been of much public utility if the basket-makers had given a specific description of the best kind of osiers, the planting of which they wished to be encouraged by premiums. The planters would in that case have procured those only; much expense would have been saved to other gentlemen as well as himself, and a very considerable addition would have been made in the plantations to the stock of the best osiers which are imported from abroad. As we have no generic or specific terms, he will endeavour to give a plain vulgar account of those only which are selected by the most experienced planters in his neighbourhood. Osier, in common, is a word of very indeterminate signification; it is certainly a species of the salix, but admitting of many varieties. He has endeavoured to reduce them to two classes; first, those which are so called by the growers and basket-makers, distinguishable by their more blunt, mealy, or downy leaf; and secondly, those that have a leaf more pointed, smooth, and green, resembling that of a myrtle. Of the first class he has nine or ten varieties, all of which he shall eradicate, save one, viz. that which is called the *grey*, or *brindled osier*. It has, in common with the others, the light-coloured leaf, but is known by having its bark streaked with red, or blood colour. It has not been long introduced into this country. It grows vigorously, is very hardy and tough, and bleaches well. All the others of the first class delight in a wet soil, and will flourish even in the most barren kind of peat; but they are coarse and spongy, have a large pith, are brittle, and very perishable; they are, however, used sometimes for the stouter parts of large baskets, and unpeeled for wine-hampers. They grow quick and large, and a small number will fill the ell bunch, by which all osiers are sold; they are profitable to those growers only who live near London, or whose plantations are contiguous to water-carriage. He has some acres of them; and were he to send them there by waggon, which is the only mode of conveyance, they would not pay for the carriage. In time of war, when our intercourse with France and Holland has been interrupted, where they grow better sorts, they have been too much resorted to, which has brought our baskets into disrepute, and lessened the demand for them in foreign markets; this, together with the enhanced price of insurance, accounts for the fact, that war makes osiers in this kingdom both dear and cheap; that

is, dear at the commencement for want of importation, and cheap during its progress, for want of exportation, after having been manufactured into baskets and other works, to which they are applied."

And "of the second class are, 1, the Welsh, both red and white; the red having the preference, and is said to have been brought originally from Wales; they form an almost essential part of every plantation, as no other is fit to tie the bunches after the rods have been peeled and whitened. A bunch is formed by compressing the osiers in an iron hoop or band, of an ell in circumference; eighty bunches make a load, which four years back sold at 18*l.*; it is not now worth 12*l.* The best land will produce a load on an acre, but half a load is not a very bad crop on bad land. The expense of weeding, renewing, cutting, and peeling, is about 5*l.* per acre, when the business is well done; but they often go unweeded, when they are sold at a low price, to the great decay of the plantations. The *Welsh* are also used to tie the reed sheaves for thatch; they are so bitter that cattle will not browse them, unless driven to the extremity of hunger, and rats will not touch them, although they will destroy almost every kind of bandage. They were formerly grown for the coopers, to bind their hoops; but for this use they have long given way to the hazel; they are very tough and durable, and would rank with the best sorts for the use of basket-makers, were they of a better colour when peeled." And "2. The *west country Spaniard*, which is supposed to have been first introduced into the west of England from Spain. It is very different from the *Spaniard*, which is a species of the larger willow, and used for hedging-wood and hurdles. In the Isle of Ely it was long in high estimation, until others were introduced, supposed to be superior in some of their qualities; the bark is of a bluish-grey colour: it grows stout and stately, and objects to no soil; the grower, however, urges against it what he thinks to be a strong objection, viz. that it produces a small crop. It bears, comparatively, only a few shoots on a head; this is certainly true; but what then? it is not so profitable. He admits it, provided only an equal number be planted on an acre with those that bear more shoots; but why should the grower tie himself to plant an equal number of different sorts on a given quantity of land? The nurseryman is governed by no such rule; and the farmer would become an object of pity, were he to sow an equal quantity of every sort of grain on an acre. The planter and farmer should be guided only by the burden which the land is capable of bearing. His experience teaches, that an acre of land will carry, of this sort, 14,000 plants, with more ease than 12,000 of the best new kind. 3. He has not been able to learn where the *new kind* originated. It is well known every where; and although it must be much older in some counties than others, it is universally called by that name. There are, however, two sorts; the other is called the *last*, or *best new kind*. The bark of the former is of a light brown colour; that of the latter resembles rusty iron, with light longitudinal stripes; it is on that account called, by some persons, the *cordero*. When the new kind was first introduced into the Isle of Ely, it soon expelled most of those of the first class; the few that are retained are used by the fishermen to make grigs, or twig tunnels, to catch eels and other fish: it still maintains considerable reputation, but yields to the *last* new kind, which, besides possessing most of the best properties, produces, on an average, at least four shoots on the head more than any other, and it will grow well on a dry mellow soil. As its shoots are more numerous, a greater space should be allotted to it, to draw nourishment from the earth, and to admit the rays of the sun and circulation of air, so necessary

necessary to the growth of every plant; 11,000 an acre is quite sufficient on good land. But the best of all, considered in a public or political view, is, 4, the *French*. Under this name the *ground-setter* is, he supposes, frequently sold; and he is informed, that it was so called, from its tendency, when neglected, to direct its shoots amongst grass and weeds, parallel with and near the ground; it is of the same quality, colour, and appearance with the French, except that it has at the point a tuft formed of leaves curled inwards, which has the appearance of a small withered rosebud. You will easily know both from all others, thus: draw them through your fist from top to bottom, and the leaves will snap off with the brittleness of glass. The ground-setter grows very slowly, and is rejected by the planters on that account; the French, although more luxuriant, is also of comparatively slow growth; and it requires a great number to make up the bunch; but it is exceedingly taper, pliant, close-grained, tough, and durable. The basket-makers are more desirous of it than any other, as it is best suited to make the smaller and finer baskets, hats, fans, and other delicate articles. As it is much disregarded by the planters in this kingdom, the basket-makers, in times of peace, import vast quantities from France, the Austrian Netherlands, and Holland, where it is cultivated with great success. It is singular, that it should be imported cheaper than our planters can afford to grow it; the lands in France and Holland are much dearer than our fens. As an article of commerce, or as a raw material, it deserves every encouragement that the public or individuals can give it; and if it be not so profitable to the grower, it is always of ready sale."

He has also heard of another sort, which is well spoken of, called the *red Kent willow*; but he is doubtful whether he is possessed of it or not; they have in this neighbourhood a very hard, tough willow, of a reddish colour, of which hurdles, cribs, &c. are generally made. He planted it last year, in foot-fets, for the use of basket-makers; but as the experiment is only in process, he can say nothing of its utility.

Planting.—The following is the method of planting practised in these cases, on the banks of the Thames, as described in the Transactions of the Society for the Encouragement of Arts, &c.

"The ground is dug during the winter a full spade's depth, and left rough, to prevent the tides from running it together again before it can be planted.

"The work begins in the month of March. The planter having procured the sets or plants, which are fifteen or sixteen inches long, cut diagonally off the strongest shoots of the last year's growth, care being taken that they are not cut near to the top of the rods, that part being too porous to make a sound plant, the ground is then marked out into rows two feet asunder; and the sets are stuck in the rows, eighteen inches from each other, leaving about seven inches of the sets above the ground. This work is very easily done, without using even a dibble or a setting-stick; but, when planted, care must be taken, by hoeing, to keep them as free from weeds as possible; or if the ground be too wet for the hoe, a weeding hook may be used to keep them down: this is absolutely necessary to ensure a good plantation. It is also equally necessary to keep the ground well drained, to prevent the tides remaining upon it any considerable time, for on that also depends the firmness and good quality of the rods.

The willows are cut over the first year with a bill-hook; the shoots are cut off close to the stock and bound up in bundles, or boulds, as they are called, which measure forty-

two inches round, at sixteen inches above the butt ends. The same process of weeding must be pursued every summer; while they are shooting up from the stem. The next season a cutting portion of them is left to stand another year, where large stuff is wanted for the ribs of large baskets, &c.

"The planting of willows is expensive in the first year; but if well managed they produce a great profit, as they improve in quantity every year."

But in regard to the most advantageous modes of planting, there is in the above volume of the Transactions of the Society of Arts, &c. a diversity of opinion. The different qualities of soils are not sufficiently attended to. A single experiment is liable to deceive; what may hit or fail one year, may be the contrary the next. "It requires a diversified series of experiments to enable us to form a right judgment. The plantations of the year 1794, made on banks of soil thrown out of the ditches on each side, and those made on the level ground, flourished equally well that year. It was difficult to judge of them the next year, for they had been more or less injured by the vast inundation of all the fens of the Isle of Ely, and which was not removed in many places until late in the summer; but in the third year the advantage was manifestly in favour of those which had been made on banks or elevated beds. They have in this district from ten to fourteen inches of vegetating soil on the surface; immediately beneath it is a black or brown barren peat, of a loose texture. In the drought of summer, when the moisture is exhaled from the upper and more tenacious soil, the water instantly filters through the peat, and leaves the plants destitute of their best nourishment; but when the peat is thrown upon the solid earth, it will prevent the rays of the sun from penetrating to the bottom; and when the water falls in the ditches, the lower and more tenacious soil will retain a sufficient quantity of it for the use of the plants. Care should be taken to insert the sets through the peat into this lower stratum; they will strike their radicles the first year into this more solid earth; but when the peat has been meliorated by the sun and air, and been compressed, and become more adhesive, they will strike higher in the stem, until the radicles or fibres approach the surface. It must be admitted, that this is an expensive method, and lessens the quantity of land to be planted upon. To remedy this inconvenience, the writer lays out his land in beds or barrows, of eighteen feet wide; ditches of nine feet wide are dug on each side; the top of which, fourteen inches thick, is laid on the barrows; turf for fuel is then dug in the ditches, the expense of which is about 1s. 8d. a thousand; they are sold for 2s. 6d.

The beds or barrows, now consisting of about two feet and a half thick of solid earth, above the surface of the peat, are planted the following autumn, and produce good crops; when the water is sufficiently low, he casts upon these beds a fetid vegetable substance, vulgarly called bear's muck; it resembles wet shag tobacco, and lies under the peat; it is extremely useful to the plants; and although it is, in its primitive state, a perfect *caput mortuum*, when exposed some time to the air it putrefies, affords mucilage, and becomes a good manure. In embanked districts, subject to frequent and long inundations, two other advantages are obtained from these raised beds; the others are thereby removed farther from the reach of the ice, which on a thaw floats into the lower plantations, and does them much injury. When the waters are high, in the cutting or planting season, the beds are more accessible than the level ground; but having had the command of the water last summer, by a mill or engine, he dug out the peat into turf, having first laid

laid aside the upper spit; the turf being removed, he shall return this spit into the ditch, and plant upon it; thus no ground will be lost."

It is further stated, that "in the year 1796, he made an experiment on an acre of land of this quality; he ploughed one half of it, and the other half was dug with the spade, about fourteen inches deep; the sod of that thickness was inverted by the spade. The plantation on the ploughed land was very weak, and failed in many places; that which followed the spade did better; but they are both so bad, that they must be renewed this year. On the former, the best land lay uppermost, which, when deprived by the heat of its moisture, derived no assistance to support the plants from the peat that lay underneath; on the latter, some of the best land was laid in the ground, but not deep enough to retain a sufficient quantity of moisture. The preceding year he planted in a piece contiguous, on banks as before described, and there the osiers do well. And he has a rich loam lying on a bed of potters' clay; the situation is low, and exposed to the water; French osiers were very scarce, and he could procure only a few hundreds last year; determined to eke them out as far as he could, he laid them down in their whole length, and pegged them on the ground; they struck good roots into the earth, and threw out abundant shoots. This experiment, together with that of planting upon banks, will enable him to answer the question often asked, 'Of what length ought the set to be?' It depends entirely upon the nature and situation of the land. There should be so much of it in the ground as to enable it to procure moisture, and so much of it out of the ground as to make it accessible in the cutting season, where much weeding is not required; and where there are no floods, or where they subside quickly, there ought to be very little of it out of the ground. The nourishment, in that case, will pass immediately from the roots to the rods or shoots, without the burden of first supplying the head or stock."

Season of Planting.—In respect to the time of planting, every experiment he has made confirms the opinion, that the "autumn, and not the spring, is the most proper season for planting. Those who think with him say, that the fall of the leaf indicates the proper time to cut the sets; it certainly is so in general; but the leaf of the osier, like that of the oak and other trees, will sometimes prolong its departure. The stagnation of the juices is the true criterion by which to judge, not on account of the set, but of the trunk, lest, if you amputate it whilst the juices are in circulation, it should bleed to death. He has planted in the first week of October, and the sets appeared to remain torpid for the remainder of the year; about Christmas he took up several of them, and was much pleased to find that they had struck root, although they had given no outward appearance of vegetation from the time of planting. It is probable that the earth retains a sufficient portion of the summer heat until the autumn, to give life to plants at the root, when the atmosphere may at that time be so cold as to discourage any exertions above-ground; and perhaps nature may be more vigorous when her operations are confined to one point. It is added that, when you plant in spring, the set seems (if he may speak so figuratively) to have its attention distracted by two operations not very homogeneous, the one upwards, the other downwards. It is impelled to shoot its radicles into the earth, to form its stability, and procure sustenance; and it is called upon at the same time to put forth its leaves and branches. To speak without a figure, the prolific sun and air induce it to exhaust the juices, in extending the shoots before the roots are sufficiently strong and large to supply the drainage; hence it is that, contrary to the commonly

received opinion, a warm and dry spring is always injurious to the young plantations. If there be not sufficient rain to convey sustenance by the leaves and bark, in aid of the small quantity procured by the root, the plant must die or dwindle, and it is very observable, that the first vigour of the late-planted set is a sure prognosticator of its decline or dissolution. In the autumn of 1795 he made a small plantation, and on the remainder of the piece he planted in March following. In the beginning of May, those last planted were the forwardest, which, for a time, staggered his opinion of the most proper time for planting; but in June, those planted in the autumn had much the advantage, and have continued to grow well: those that were set in the spring decayed in summer, and many of them died. When the fibres have been formed before the winter, or when a tendency to form them has been observed, by the swelling of the bark, and particularly at the eye, the plant is enabled to charge itself with a sufficient portion of the juices to answer the demand of spring; the rule, therefore, which he lays down for himself, where no obstructions are raised by the water, is to plant as early in the autumn as he can cut the sets, without endangering the parent stock."

In the fifth volume of the Farmer's Magazine the following method is stated to be had recourse to: in the fens many holts (as they are provincially called), or plantations of osiers, are raised, which beautify the country, keep the stock warm in the winter, and provide much useful wood for baskets, cradles, and all kinds of wicker-work, and also for cribs for cattle to eat straw or hay out of, or to make stows or hurdles to fence in stacks, part lands, &c. &c.; or they make hedges that last four years well, and if allowed to grow five years, many of them would make fork-shafts for hay and corn. These holts or plantations of osiers are commonly made in the middle of the land, in the north and east corners, and sometimes at any end, side, or place, that appears most easy, or in any respect the most desirable. The situation and size of the holts vary exceedingly. Sometimes they are made in the middle of lands, from 10 to 60 yards square, and in others, in the sides or ends of, from 1 yard wide to 11, and from 10 to 100 yards long.

The mode of planting is very simple; it is, first to dig the land from 6 to 12 inches deep, and then to prick down cuttings of four years' growth, and 18 inches long, at about three feet distance from each other. The soil should be moor or clay, or any thing that is low and wet; if drowned half the year it will be but little the worse.

These holts or osier plantations must be fenced round, either with dykes, which is the most common, or with hedges, as is the most convenient. The proper season for making them (they seldom fail of growing at any time) is from the fall of the leaf till very late in the spring, and the sets are very cheap. Such plantations are cut annually for baskets, skeps, scuttles, cradles, and all kinds of wicker-work, but when the osiers are kept for sets, or to make hedging wood, or for stows or hurdles, they are cut only once in four years.

Wherever the farmer has lands that are suited to this sort of cultivation, as there is a constant demand for such articles, he should never neglect making plantations, as nothing that he can put upon such land will probably pay him so well.

Mr. A. Young states, that "the late Mr. Forby, of Norfolk, knew the value of these plantations well for various purposes. Osiers planted in small spots, and along some of his hedges, furnished him with hurdle-stuff enough to make many dozens every year, so that he supplied himself entirely with that article, as well as with a profusion of all sorts of baskets, especially one kind that he used for moving cabbage-plants, for which purpose they were much better

than tumbling the plants loose in a cart. The common offer he cut for this purpose at three years, and that with yellow bark at four."

OSIMO, in *Geography*, a town of the marquisate of Ancona, the see of a bishop, anciently a city of Umbria, named "Auximum;" 12 miles S.S.W. of Ancona. N. lat. 43° 38'. E. long. 13° 36'.

OSIO, TEODATO, in *Biography*, is the author of a curious speculative tract, published at Milan in 1637, entitled "L'Armonia del rendo parlare, con ragione di numeri Pitagorici discoperta da Teodato Osio," or, the harmony of common speech or simple prose and verse, established by the power of arithmetic, of musical speculations, and the Pythagorean ratio of numbers.

We procured this little book with great eagerness, in hopes that we should find some acute and ingenious reflections on recitative, with nice discriminations between common speech, narrative melody, and air. But in the most ample and minute index we ever saw to so short a tract, the word recitative never occurs. And, indeed, when this book was published, its forms and phraseology were hardly settled. The new dramas, called operas, had only been performed occasionally at the grand duke's court, and private representations at Florence. So that in 1637, the rest of Italy scarcely knew of the existence of a *musica rappresentativa*, or recitative, which was neither singing nor speaking, but the intermediate utterance or emission of vocal sound, between both. The first opera at Venice was performed in 1637, the precise period of signor Osio's publication, which is written in an obscure and mysterious style, bordering on pedantry; nor is it easy to say, after perusal, what is the author's object.

Osio, in *Geography*, a town of Sweden, in East Gothland; 32 miles W.S.W. of Linköping.

OSIRIS, in *Mythology*, one of the great gods of the Egyptians, to whom they paid their chief worship. Osiris was supposed to represent the sun, and Isis the moon.

Some writers in theology have supposed, that all the other deities of the Egyptians were only attributes of Osiris and Isis. See ISIS and ORUS.

The worship of Bacchus among the Greeks was formed upon that of Osiris, as we learn from many passages in Diodorus Siculus. (See BACCHUS.) Osiris was among the Egyptians the symbol or emblem of the sun, which was the first object of their idolatry, and Isis was that of the moon; and it is said that their names refer to those luminaries, since in their language Osiris denotes "one who sees clear," and Isis the "ancient," an expression which among them signified the moon. All the learned agree, that the oxen Apis and Mnevis, consecrated to Osiris after his apotheosis, were the symbols of the sun. Thus, whether it was that the Egyptian priests, to cover the history of this prince from the eyes of the people, gave out that he was really the sun, or whether acknowledging Osiris to have been a mortal man who had governed Egypt, and conferred many blessings upon it, they were willing to pass it upon the world, that his soul was gone to reside in that orb, still they agreed that he was now become that radiant luminary, who by the benign influences of his beams, diffuses fertility and plenty over all, and that to him vows, prayers, and sacrifices were to be addressed. Thus was the worship of Osiris confounded with that of the sun, and that of Isis, with that which was paid to the moon. In this way the priests had found the art of making idolatry less gross, by saying it was not a mortal man, but an eternal star, which was the object of public adoration. It appears that the Egyptians sometimes considered Osiris and Isis as real persons, who had governed Egypt with consummate

wisdom, and at other times as beings of an immortal nature, who had framed the world, and ranged matter into the form which it still retains. Those who suppose that they had been human persons, agreed that they were brother and sister; but they differ about their parents. The most common opinion is that reported by Diodorus Siculus, who says, that the Sun was the first who reigned in Egypt; that he was succeeded by Vulcan, and Vulcan by Saturn, who having married Rhea, his sister, had by her Isis and Osiris. The Egyptian mythology with regard to these fancied deities is stated by some writers in the following manner. The Egyptians, seeing good and evil equally prevalent in the world, and not being able to conceive that a being essentially good should be capable of permitting evil, and much less be the author of it, were the first who invented two principles, the one good, the other bad, and introduced this error which afterwards so generally prevailed. The good principle they represented under the name of Osiris, and the bad one under that of Typhon; hence sprung the wars and persecutions of the latter against his brother, whom he afterwards cut off. As they attributed all the evil that existed in the world to Typhon, so they considered Osiris as the author of all the good. The creation of the world, for a long time disputed and retarded by the machinations of the evil principle, together with the order and harmony that prevailed in it, was the work of Osiris; and all the wars and troubles, and kinds of evils that ravage the universe, proceeded from Typhon. The good principle, according to the representation of Plutarch, founded on ancient traditions, possessed three qualities, of which the one performed the office of father, and this was Osiris; the other that of mother, who was Isis; and that of son, who was Orus, the first production of the father and mother. (See ORUS.) Some authors have alleged that Osiris was Joseph, and others maintain that he was Moses; whilst it is asserted by others, that this king of Egypt was more ancient than they, and that his worship was established in their time through all Egypt, since the Israelites imitated its ceremonies in the adoration of the golden calf.

Banier is of opinion, that Osiris is the same as Mizraim, the son of Ham, who peopled Egypt some time after the deluge, and who, after his death, was deified; and he is called by the ancients the son of Jupiter, because he was the son of Ham, or Hammon, whom he himself had acknowledged as a god. Marsham takes Osiris to have been Ham himself, known under the name of Menis at the head of the dynasties, which succeeded to the gods and demigods. Indeed the learned in general allow, that Osiris was one of the first descendants of Noah by Ham, and that he governed Egypt, whither his father had repaired, and there founded a small kingdom, a few years after the dispersion which happened in the time of Peleg. Diodorus asserts, that this prince is the same with Manes, the first king of Egypt; and perhaps at his apotheosis his name was changed to that of Osiris. For other particulars we refer to the article ISIS.

The learned Jablonski deduces the term Osiris from Ofchiri, denoting "he who makes time." Accordingly it is alleged, that the Egyptian astronomers, after repeated observations, regulated the year by the course of the sun; that the solar year was established by the academy of Heliopolis, 1325 years B. C., 320 after the departure of the Israelites; and that the priests, who till that time had honoured the sun under his proper name of "Phrá," bestowed on him, in commemoration of so important an event, that of Osiris, or author of time. Savary's Letters in Egypt, vol. ii.

OSITH, or OSYTH, *St.*, in *Geography*, an island of England,

land, at the mouth of the Blackwater river, or Malden water, in the county of Essex, with a village. It is said to have changed its name from Chiche to that of St. Osith, who was a virgin, murdered here by the Danes, and canonized. A monastery of black Augustine canons was founded here to her memory by Richard Beaver, bishop of London, in the year 1120. In 1801 St. Osith contained 1268 inhabitants; 11 miles S.E. of Colchester.

OSIUS, in *Biography*, bishop of Cordova, in Spain, was born in 257. He became the friend of Constantine, who by his persuasions convened, in 323, the council of Nice, where Osius presided. Under the emperor Constantius he was so much persecuted, that he turned Arian. It should however be mentioned, that he was then very aged, being almost, or entirely, 100 years old. Having made his recantation, he was permitted to return to his diocese, where he died soon after, extremely penitent, and in his last moments renounced the Arian heresy with great fervour.

OSIUS, FELIX, a learned Italian, was born at Milan in 1587, and became professor of rhetoric at Padua, where he died in 1631. His principal works are, 1. *Romano-Græcia*. 2. *Tractatus de Sepulchris Epitaphiis Ethnicorum et Christianorum*. 3. *Elogia Scriptorum illustrium*; and several other works, in high estimation at the period in which he flourished.

OSKIN, in *Agriculture*, a provincial word used to signify an ox-gang; or a quantity or share of common field-land, proportioned probably to the size of the fields and number of messuages in the given township, at the time the fields were set out or appropriated among the houses.

OSKIPARO, in *Geography*, a town of Persian Armenia; 36 miles N.W. of Kanja.

OSKOL, a town of Russia, in the government of Kursk; on the river Oskol; 60 miles S.E. of Kursk. N. lat. 50° 50'. E. long. 37° 14'.

OSKOVA, a mountain of Bosnia; 20 miles S.E. of Serajo.

OSLAWA, a town of Moravia, in the circle of Brunn; 12 miles W. of Brunn.

OSLEOM IRON, in the *Wire Works*, a particular sort of bars of iron, wrought on purpose for the manufacture of iron wire. These are small and square, and the first thing done with these, towards the making them into wire, is the straining, or drawing them at a furnace to small rods, of the thickness of one's little finger; these they bow round, and deliver them to the wire-drawers. See *WIRE*.

OSMA, in *Geography*, an almost ruined town of Spain, in Old Castile, on the Duero, the see of a bishop. In the year of Rome 682, it took part with Sertorius, and was destroyed by Pompey. In 931, the Moors were defeated here by the Christians; 40 miles S.E. of Burgos. N. lat. 41° 45'. W. long. 2° 58'.

OSMAN, TOPAL, in *Biography*, a distinguished Turkish general, was born in 1673. He was brought up among the youth of the seraglio destined to public employments, and by his proficiency in learning languages, and in military exercises, and his amiable disposition, obtained the esteem of his masters. He was appointed superintendant of the carriages, and in 1698, or 9, he was sent to Cairo with a message from the emperor. In his passage the vessel in which he had embarked was attacked by an Algerine cruizer, and taken after an action, in which Osman, while fighting with great bravery, was dangerously, but not mortally, wounded in the arm and thigh. The consequences of the latter wound rendered him lame for life, and obtained for him the name of *Topal*, which signifies *halting*. The prize was carried into Malta, where it was visited by Vincent Arniaud, a

native of Marseilles, then post-captain. Osman, on his coming on board, said to him, "Do a generous action—ransom me—you will be no loser by it." Arniaud asked the captain what he demanded for the ransom of this slave, to which the captain replied, "a thousand sequins." Arniaud now turned to Osman; "I," said he, "never saw you before in my life; I know nothing of you, and you ask me to pay a thousand sequins for you on your bare word." "Both of us," said Osman, "act in character. For myself, I am in fetters, and it is natural that I should employ every means to regain my liberty. You naturally distrust my faith. I have no security to give but my word, in which you have no reason to confide; if, however, you will run the risk, you will not repent it." Arniaud immediately agreed with the captain for five hundred sequins, which he paid down, and putting Osman on board a bark of his own, sent him medical assistance, and afforded him every means necessary for his recovery. When perfectly recovered, Osman proposed to write to Constantinople for remittances to pay the debt, and desired to be dismissed upon his parole. Arniaud immediately allowed him to take the bark, and dispose of it as he pleased. He immediately set sail for Damietta, whence he ascended the Nile to Cairo. He there paid to the captain a thousand sequins, on account of his benefactor, and made him a handsome present for himself. He executed his commission, returned happily to Constantinople, and was himself the bearer of the news of his captivity. His gratitude to his deliverer never forsook him, and during all the steps of his elevation, he never intermitted a correspondence of letters and of presents with him. He even extended his beneficence to all the Frenchmen with whom he had any concern. In 1715, in the war between the Turks and the Venetians, the grand visier, Ali-Bashaw, intending to invade the Morea, assembled his army in the neighbourhood of the isthmus of Corinth, and gave in charge to Osman to force the passage, which he effected, and at the same time carried the city of Corinth by storm. He acted as second in command at the siege of Corfu, in the following year; and when it was raised, he remained three days after the general, to favour the retreat of the troops, not withdrawing till they were in safety. He was appointed Seraskier, or chief commander in the Morea, in 1722, on which occasion he requested Arniaud to send him one of his sons, that he might give him a lucrative employment. He was next nominated to the government of Romelia, having obtained first the dignity of bashaw of two tails, and now of three tails. In 1731 Osman was called to the high dignity of grand visier: he immediately caused Arniaud to be informed of this promotion, who, with his son, visited Constantinople on the occasion, bringing with him twelve Turkish captives, whom he ransomed. The visier received them in the presence of the great officers of the empire, to whom he related the story of his benefactor's generosity to him. He treated them with the most affectionate familiarity, and gave them some substantial proofs of his kindness. His reign as visier was of short duration; he was deposed in 1732, more to the regret of the people, to whom he had restored plenty, than to his own; and he felicitated himself that he left his place with a good conscience, and without forfeiting the regard of his sovereign. On his road to the government of Trebisonde, to which he had been appointed, he was ordered to take the command of the Turkish army in Persia. In July 1733, he fought a bloody battle with Thomas Kouli-Khan, in which the Ottoman arms were victorious, and the Persians were said to have lost 60,000 men. His success was rewarded with an accession of power and dignity. In a second battle, which was extremely disastrous to the Turks, Kouli-Khan took

took his revenge, and Ofman was killed by two musket-shots. This was in the month of September, 1733. Moreri. Univer. Hist. Frazer's Life of Nadir-Shah, &c.; 1742.

OSMAN I., emperor of the Turks, was the son of Achmet I., and succeeded his uncle Mustapha in 1618. He declared war against Poland in 1621, but after several defeats, he was obliged to conclude a disadvantageous peace. Attributing his want of success to the Janissaries, he resolved to substitute a militia of Arabs in their room, which provoked them, that they deposed him, and placed Mustapha on the throne, who caused Ofman to be strangled in 1622. Ofman II. succeeded his brother Mahomet in 1754, and died in 1757.

OSMAN Aga, in *Geography*, a town of Walachia; 22 miles S.W. of Galacz.

OSMANDGIK, a town of Asiatic Turkey, in the government of Sivas; 140 miles N.W. of Sivas. N. lat. 40° 45'. E. long. 35° 10'.

OSMANTHUS, in *Botany*, a name given by Loureiro to the *Olea fragrans*, alluding to its odoriferous flowers. See *OLEA*.

OSMERI, in *Ichthyology*. See *SALMO*.

OSMI, in *Geography*, a town of Daghestan; 28 miles N.W. of Dschund.

OSMITES, in *Botany*, a Linnæan genus, whose name, derived from *οσμη*, a smell, or *savour*, is expressive of its very powerful odour. Linn. Gen. 441. Schreb. 575. Willd. Sp. Pl. v. 3. 2258. Mart. Mill. Dict. v. 3. Juss. 186. Lamarck Dict. v. 4. 647. Illustr. t. 704. Gærtn. t. 174. (Bellidialtrum; Vaill. Mem. Par. 1720.)—Class and order, *Syngenesia Polygamia Frustranea*. Nat. Ord. *Compositæ Discoideæ*, Linn. *Corymbifera*, Juss.

Gen. Ch. Common calyx imbricated, gibbous; the inner scales elongated at the point. Cor. compound, radiated; florets of the disk perfect, numerous, tubular, five-cleft; those of the radius female, ligulate entire. Stam. (in the perfect florets) Filaments five, very short; anthers cylindrical, tubular. Pist. (in the perfect florets) Germen oblong; style thread-shaped, the length of the floret; stigma cloven: the female or ligulate florets differ in having a smaller germen and an obsolete stigma. Peric. none, except the unchanged calyx. Seeds, of the perfect florets, solitary, oblong, with scarcely any crown; or bordered, with an obsolete, somewhat chaffy one; in the female florets mostly abortive or imperfect rudiments. Recept. chaffy.

Eff. Ch. Receptacle chaffy. Down obsolete. Florets of the radius ligulate. Calyx imbricated, scaly.

1. *O. Bellidialtrum*. Linn. Sp. Pl. 1285. (Anthemis fruticosa; Amoen. Acad. v. 4. 330.)—Leaves linear, downy. Stems scarred.—Native of Ethiopia.—Stem shrubby, scarred by the fallen leaves, which are awl-shaped or linear, triangular, in tufts, at the ends of the branches, sessile, downy all over. Flowers terminal, sessile, several together at the ends of the stem and branches, their disk yellow, and radius white.

2. *O. dentata*. Willd. n. 2. Thunb. Prodr. 163.—Leaves obovate, toothed, villose.—A native of the Cape of Good Hope, adopted on the authority of Thunberg. We are not acquainted with either a description or figure of this species.

3. *O. camphorina*. Linn. Sp. Pl. 1285. Mant. 477. Gærtn. t. 174. (Bellis camphorifera africana aquatica, flore albo; Seb. Mus. v. 1. 143. t. 90. f. 2.)—Leaves lanceolate, serrated from the base.—Found also at the Cape of Good Hope.—Stems quite simple, waved, furrowed, each bearing a single head of flowers. Leaves alternate, sessile, deeply serrated or toothed, naked, gradually smaller towards the top,

much resembling those of *Chrysanthemum Leucanthemum*, the Ox-eye Daisy.—Flowers capitate, terminal, with a yellow disk and white radius.—The whole plant has a very strong camphoric odour, whence its name.

4. *O. Asteriscoides*. Linn. Sp. Pl. 1285. (Leucanthemum fruticosum camphoratum, foliis crassius, angustius acutis; Burmann. Afric. 161. t. 58. f. 1.)—Leaves ovato-lanceolate, downy, dotted, obsolete ferrulated.—Native of the Cape.—Stem thick, branched, warty. Leaves alternate, thickly set, slightly embracing the stem. Flowers capitate, terminal, sessile, yellowish-white.—The smell of camphor is not so strong in this species as in the preceding.

5. *O. calycina*. Linn. Syst. Veg. ed. 14. 783. Suppl. 380. (Lapeirousia calycina; Willd. Sp. Pl. v. 3. 2260. Thunb. Prodr. 163.)—Leaves lanceolate, naked. Calyx remarkably scaly.—Like all the preceding species, a native of the Cape of Good Hope.—Stem shrubby, erect, proli-ferous, not thickened; branches a little downy. Leaves scattered, erect, narrow, lanceolate, naked or slightly downy, striated, veined beneath. Flowers terminal, sessile, yellow.

See Dr. Smith's reasons for retaining this last species as an *Osmium*, under the article LAPEIROUSIA of this work.

OSMIUM, in *Chemistry*, a simple substance, and one of the metals. We have already stated, under the article IRI-DIUM, that when the black powder, which remains after dissolving platina from the grains, as they come from South America, is alternately treated with an alkali and an acid, two solutions are obtained. The acid solution contains the iridium, while the alkali contains the metal called osmium.

For the discovery of this metal we are indebted to Mr. Tennant. Fourcroy and Vauquelin had previously made some experiments upon the black powder above alluded to, but it seems they had confounded the two metals which it afforded.

The alkaline solution from the black powder contains the oxyd of osmium, to which it gives a yellow colour.

In order to obtain the oxyd pure, the alkaline solution must be put into a retort. When sulphuric acid is added, and heat applied, the oxyd comes over, dissolved in water, to which it gives a strong smell and a sweetish taste.

If the black powder be heated with nitre in a retort, at a temperature a little short of redness, the oxyd of osmium rises and condenses in the neck of the retort, in the form of oil. On cooling, it concretes into a semi-transparent mass.

This substance is soluble in water, and possesses similar properties to that obtained from the alkaline solution. It holds its oxygen with so little affinity, that if mercury be shaken with either the alkaline or the aqueous solution, the metal is set free, and forms an amalgam with the mercury. If the mercury be distilled from the alloy without contact with the air, the osmium remains in a state of purity. Osmium is of a dark blue-gray colour, having metallic lustre. This last property, together with its forming an alloy with mercury, sufficiently prove its metallic nature.

When heated in the open air, it appears to evaporate. It is not, however, the pure metal which evaporates, but this occurs, in consequence of its combining with the oxygen of the atmosphere, since the metal is not volatile when the oxygen is excluded. When it is heated ever so strongly in a close crucible lined with charcoal, it does not fuse.

The most remarkable property of this metal is its not being oxydated by any of the acids, although it easily combines with the oxygen of the atmosphere, and with that arising from the decomposition of nitric, above stated.

It is not less curious that it should be oxydated and dissolved

by potash. Although the oxyd of this metal is soluble in water, and its affinity for oxygen small, it does not change vegetable blues, nor exhibit any other acid properties.

The solution of oxyd of osmium, like that of gold and silver, stains the skin permanently.

An infusion of galls changes it to a purple colour, which ultimately becomes blue.

If ether or alcohol be added to the aqueous solution, the oxyd is decomposed, and the metal precipitated: a similar effect would no doubt take place by passing hydrogen, or sulphuretted hydrogen gases, through the solution.

This oxyd is decomposed by all the metals excepting gold and platinum. The other metals being immersed in the solution of this oxyd, soon deprive it of its smell, while the osmium is precipitated in the metallic form.

We are indebted to Mr. Tennant for these facts, which he made out at the time he discovered the metal. It is to be regretted that no new facts have been added, by which we might know the proportion of its combinations with other bodies.

OSMOND, in *Biography*, a saint, was born in Normandy, of a noble family. In 1066 he followed the fortunes of William, who became the conqueror of England, and who made him the chancellor of this kingdom, and nominated him to the bishopric of Salisbury. He reformed the liturgy for his diocese, which form afterwards became general throughout the kingdom, under the name of the Salisbury liturgy. He died in 1099, and was canonized by Calixtus III.

OSMOND Royal, or Flowering Fern, in *Botany*. See OSMUNDA.

OSMONDS, in our *Old Writers*, a kind of iron anciently brought into England. It is mentioned in stat. 32 Hen. VIII. cap. 14.

OSMORZKOI, in *Geography*, a town of Russia, in the government of Kolivan, on the Irtsch; 201 miles W.S.W. of Kolivan. N. lat. 53° 15'. E. long. 76° 14'.

OSMUNDA, in *Botany*, a word of which no explanation has ever been given, and which Linnaeus, in his *Philosophia Botanica*, 160, mentions as one of those which can hardly be traced to any language. In this he was mistaken; for *Osmund* is a Saxon proper name for a man, and expresses domestic peace. Its application to the plant is found to have originated in England. The elegant *Filix florida*, or Flowering Fern, which first received it, and which is an aquatic plant, should seem, by Gerard's herbal, a type or memorial of some "Osmund, a water-man," whose history had not come down, even to that old writer, but whose heart, he says, was commemorated in the core of the root. Linn. Gen. 559. Schreb. 756. Mart. Mill. Dict. v. 3. Swartz Syn. Fil. 160. Ind. Occ. 1578. Sprengel. Crypt. 174. t. 5. f. 38. Tourn. t. 324. Juss. 15. Lamarck Illustr. t. 865. f. 2. Brown. Prodr. Nov. Holl. v. 1. 163. (Todea; Willd. in Mem. of the Acad. at Erfurt, for 1802. 14. t. 3. f. 1. Swartz Syn. Fil. 162.)—Class and order, *Cryptogamia Filices*. Nat. Ord. *Filices*. Linn. Juss.

Eff. Ch. Capsules stalked, nearly globose, semibivalve, bursting from the base up to a striated dorsal protuberance, crowded on the back of the frond, or composing aggregate spikes on its contracted subdivisions.

Obs. From this the genus of *Botrychium*, consisting of the Linnæan *O. lunaria* and others which, like it, have bivalve capsules, without either ring or striated protuberance, and growing on a proper stalk distinct from the leafy part of the frond, is now separated. Their habits are unquestionably dissimilar.

* *All the fronds fertile.*

1. *O. Claytoniana*. Virginian *Osmunda*. Linn. Sp. Pl. 1521.—Frond pinnate, clothed when young with rusty down; leaflets deeply pinnatifid; some of them, scarcely diminished, covered with capsules.—Gathered by Clayton in Virginia. Sent, in 1772, by Samuel Martin M.D. to Kew garden, where it still flourishes, bearing fruit in the latter part of summer. The fronds are upright, a yard high, narrow, composed of numerous, short, mostly alternate, deeply pinnatifid leaflets, smooth when fully grown. Many of these, about the middle of the frond, are either totally or partially covered with innumerable brown capsules, the edges of each segment turning in, so that nothing but capsules appear on either side of the leaf.—*O. interrupta* of Michaux Boreal-Amér. v. 2. 273, though adopted by Swartz on the credit of the French author, seems by his definition to be precisely the *Claytoniana*.

2. *O. regalis*. Osmund-royal, or Flowering fern. Linn. Sp. Pl. 1521. Sm. Fl. Brit. 1108. Engl. Bot. t. 209. Bolt. Fil. 6. t. 5. Fl. Dan. t. 217. (*Filix florida*, five *Osmunda regalis*; Ger. em. 1131.)—Frond doubly pinnate; leaflets somewhat heart-shaped at their base; the upper ones contracted and covered with capsules. Native of Europe and North America, in marshy shady places. An elegant fern, conspicuous for its ash-like leaves; and copious, compound, rusty-coloured, clusters of capsules, crowning the summit of the frond.

3. *O. barbara*. African *Osmunda*. Thunb. Prodr. 171. Brown. Prodr. Nov. Holl. v. 1. 163, by accident, we presume, printed *barbata*. (*O. totta*; Swartz in Schrad. Tourn. for 1801. 105. *Acrostichum barbarum*; Linn. Sp. Pl. 1529. *Filix africana*, *floridæ similis*, in ambitu foliorum argutè denticulata; Pluk. Phyt. t. 181. f. 5. *Todea africana*; Willd. Mem. Erf. for 1802. 14. t. 3. f. 1. Swartz Syn. Fil. 162.)—Frond doubly pinnate, coriaceous, smooth; leaflets decurrent, confluent, somewhat ferrated; the lower ones unchanged, bearing capsules.—Native of the Cape of Good Hope, and of New South Wales. We obtained a fine living specimen, in June 1806, from the stove of Mr. Evans, at Stepney. This fern is evidently a congener of the *Osmunda*, in our first division more particularly. Its frond is handsome, two feet high, light green, smooth and shining, of a broad oblong figure, the branches and leaflets close and regular; the latter elliptic-oblong, bluntish, sometimes an inch in length, all decurrent into the winged stalk. Several of the leaflets nearest the main stalk, about the middle of the frond, are covered at the back with crowded elliptical masses of capsules of a rusty brown, unaccompanied by any pubescence.

** *Fertile fronds separate.*

4. *O. cinnamomea*. Woolly *Osmunda*. Linn. Sp. Pl. 1522. (*Filix non ramosa*, *latius dentata mariana*; Pluk. Mant. 78. Phyt. t. 400. f. 1.)—Fronds pinnate; leaflets deeply pinnatifid, with a woolly stalk; the fertile ones contracted and woolly.—Native of North America. It flourishes in Kew garden, having been received at the same time with the first species, from which it is known by its more woolly and cinnamon-coloured aspect, and by some of the fronds being entirely fertile, the others barren. The segments of the leaflets too are shorter and broader; the clusters of capsules hairy.

5. *O. japonicum*. Japan *Osmunda*. Thunb. Japon. 330. Swartz n. 5. (*Dsjemmai*, *Phyllitis foliis ramosis*; Kæmf. Am. Exot. 891.)—Fronds doubly pinnate; leaflets lanceolate, serrated, heart-shaped at their base; the fertile ones triply pinnate. —Found

—Found on hills in Japan, in April and May, by Thunberg, who describes it as very like *O. regalis*, except the fertile *fronds* being separate from the barren ones.—Swartz cites a figure of this in Houtt. Nat. Hist. v. 2. t. 96. f. 1. which we have not seen.

O. lancea. Narrow-leaved *Osmunda*. Thunb. Japon. 330. Swartz n. 6. Houtt. Nat. Hist. v. 2. t. 95. f. 1. *Saw*—Fronds doubly pinnate; leaflets lanceolate, ferrated; the fertile ones repeatedly compound, in a ternate manner.—Gathered by Thunberg in April and May in the Japanese island of Nipon. The first divisions of the *frond* are nearly opposite, especially the upper ones; *leaflets* alternate, rarely almost opposite, lanceolate, very finely ferrated, tapering at each end, smooth, an inch or inch and half long.

OSNABRUCK TOWNSHIP, in *Geography*, the fourth township in the county of Stormont, in Upper Canada, in ascending the river St. Lawrence. In front of this township is the rapid called the Long Sault.

OSNABURG, or OSNABRUCK, *Bishopric of*, a principality of Germany, bounded on the N. and W. by the bishopric of Munster, on the E. by the counties of Ravensberg and Diepholz, and principality of Minden, and on the S. by the county of Ravensberg; about 40 miles long, and from 16 to 24 wide. Almost a moiety of this bishopric consists of heath-lands, which yield turf and pasturage. The best spot is about Quackenbruck, and is called "Artland." It produces rye sufficient for the inhabitants, and 500 stills. It imports from the principality of Minden, and the county of Schauenburg, considerable quantities of buck-wheat, small wheat, oats, and barley. It has but a small breed of cattle. It has little wood, but besides turf, it yields coal. It has a salt-work at Disfen; and plenty of marble. In the whole country are four principal towns, and three smaller, and about 20,000 fire-places, or hearths, usually accommodating two families. The noble and free are not reckoned in this account. The land-states are the chapter, the knights, and the principal towns. The land diets are appointed by the bishop, and held in the town of Osnabruck. The inhabitants are industrious, and of the peasants, about 6000 go yearly to Holland, where they mow, till, cut turf, and do other work for hire. The religion of this country is partly Roman Catholic, and partly Lutheran. No Jews are tolerated. The principal and most profitable occupation of the inhabitants consists of spinning of yarn, and of manufacturing a coarse kind of linen for Guinea and America, from which they derive an influx of about 1,000,000 rix-dollars. This bishopric is the first and oldest in Westphalia, having been founded by the emperor Charlemagne. At the peace of Osnabruck, in 1648, it was settled that this bishopric should have alternately a Roman Catholic and a Lutheran bishop; and that the latter should be always selected out of the house of Brunswick Luneburg, and from among the posterity of duke George, and on the failure of these, out of the posterity of duke Augustus. On the settling of the indemnities at Ratisbon, in 1802, it was agreed that the bishopric should devolve on the electoral house of Brunswick in perpetuity, on condition that the king of England, as elector of Hanover, should resign all pretensions to Hildesheim, Corvey, and Hexter, and abandon his rights in the cities of Hamburg and Bremen, &c. By the peace of Tilsit, the new kingdom of Westphalia was established, and Osnaburg annexed to it.

OSNABURG, a city of Westphalia, in the bishopric of the same name, seated on the Hase, and fortified after the ancient manner. It consists of the Old and New Town, under the government of a common magistracy. The number of houses, exclusive of the public and bye-buildings, amounts to 1200; but the town is not populous. Its magistracy is

Lutheran, and annually chosen. The Roman Catholics and the Lutherans have each two parish churches. Osnabruck was formerly one of the Hanse towns. Its principal subsistence depends upon its linen-trade, and the retail of foreign manufactures. This was the first town in Westphalia which received the Lutheran doctrine. George I. king of Eng'land died in this town in his way to Hanover; 24 miles N.N.E. of Munster. N. lat. 52° 17'. E. long. 7° 4'.

OSNABURG *Island*, a small island in the South Pacific ocean, supposed to have been first discovered by Quiros, in 1606, who called it "Dezana;" by Bougainville, it was called "Boudoir;" and by Capt. Wallis, who discovered it in 1767, it was called Osnaburg: by the natives it is denominated "Maitea." It is a high round island, not above a league in circuit; in some parts covered with trees, in others a naked rock. It has no anchoring-place. The inhabitants were clothed, and appeared to be of an humane disposition; they were numerous and used canoes; some hogs were seen. Capt. Cook visited this island in the year 1769, S. lat. 17° 48'. W. long. 148° 10'.—Also, an island in the South Pacific ocean, discovered by Capt. Carteret in the year 1767. It is a small, low, flat island, appearing almost level with the water's edge, and covered with green trees. S. lat. 22°. W. long. 141° 34'.

OSNABURG *House*, a settlement of the Hudson's Bay company in North America, situated at the N.E. corner of lake St. Joseph, 100 miles W. by S. of Gloucester house. N. lat. 51°. W. long. 90° 15'.

OSNABURGH, a kind of coarse linen imported from Germany: of which there are two kinds; the one white, and the other brown. The manufacture of the white is well understood in our own country; but the method practised in Germany of manufacturing the brown sort, and of giving it its peculiar colour, is not known. Some have supposed, that it depends on the manner of bleaching the flax, and others on that of bleaching the yarn after it is spun.

OSOKOLSKA, in *Geography*, a town of Russia, in the government of Archangel, on the river Mezen; 104 miles E.N.E. of Archangel.

OSOLA, a town of the island of Sardinia; 14 miles N.N.E. of Sassari.

OSONALA, a town of Naples, in Abruzzo Ultra; 10 miles E.S.E. of Aquila.

OSORIO, JEROME, in *Biography*, a learned Portuguese prelate, who flourished in the sixteenth century, was born at Lisbon in the year 1506. From his earliest childhood he discovered a strong inclination for acquiring learning, and astonished his masters by the rapidity with which he became such a proficient in the Latin language as to be able to converse in it. At the age of thirteen he was sent to the university of Salamanca, where he perfected himself in Latin and Greek, and afterwards, by the command of his parents, applied for some time to the study of the civil law. When he was nineteen years old he removed to Paris, where he studied under the most celebrated professors in that city. Here he became intimately acquainted with Peter le Faire, one of the first associates of Loyola, a circumstance that contributed to the early introduction of the Jesuits into Portugal, by inducing him warmly to recommend the patronage of the society to king John III. Osorio went from Paris to Bologna, where he devoted himself entirely to the study of divinity, the scriptures, and the Hebrew language. After his return to his native country, he was appointed by the king professor of sacred literature at the university of Coimbra, where he gave lectures on the epistle of St. Paul to the Romans, and also on the prophecy of Isaiah. He was now ordained priest, and was appointed to the benefice of Tavará.

He received other instances of church preferment, and was at length promoted to the bishopric of Sylves by Catherine of Austria, the duties of which high office he performed with the utmost regularity and benevolence. When king Sebastian arrived at his majority, he determined to attempt the conquest of Africa, against which Oforio earnestly admonished and humbly entreated the king, foreseeing and predicting the disastrous consequences that would necessarily result from it. When he found his remonstrances unavailing, he went under various pretences to Rome, that he might not be a witness to the calamities which he was sensible were impending over his country. He was favourably and respectfully received by pope Gregory XIII. Sebastian, though he would not follow the advice of his prelate, could not bear that he should be absent from his country, and recalled him to Portugal within twelve months of his departure. He returned, and almost immediately received the fatal intelligence of the destruction of his sovereign and his army in the battle of Alcazar against the Moors. (See SEBASTIAN.) We cannot enter into the miseries in which the consequences of that battle involved Portugal, particularly after the death of king Henry. On this last event, Oforio, always the friend of peace, advised submission to the claims of Philip II., king of Spain, to the crown, and he laboured to preserve the people of his diocese from taking a part in the tumults which distracted and laid waste the kingdom. These disorders he took so much to heart, that it is said he died with grief in the year 1580. He is highly spoken of by Dupin, who says "he wrote with ease and eloquence. He is entitled to the denomination of the *Portuguese Cicero*, since no writer has more closely imitated that Roman, whether we regard his style, his choice of subjects, or his manner of treating them." His works are numerous, partly political and partly theological. The latter chiefly consisted of paraphrases on Job, the books of Psalms, the book of Wisdom, and Isaiah; and Commentaries upon several of the books of the Old Testament. His object in his paraphrases and commentaries, is not so much to explain the terms of the text as to extend the sense of it, and to shew its order and series. These works, with twenty-one sermons, were collected together, and published at Rome in 1592, in four volumes, by his nephew Jerome, canon of Evora, who also wrote a life of his uncle, which he prefixed to the collection of his works; "Notationes in Hieronymi Oforii Paraphrasim Psalmorum," printed in the third volume of the above-named collection. The work, says Mr. Southey, in the General Biography, by which the bishop of Sylves is best known, in his history "De Rebus Emmanuelis, Lusitanie Regis," of which a new edition appeared in 1791 at Coimbra, in three volumes 12mo. Of this work, which is beautifully printed, there is a French translation and an English one. The kings of Portugal, as their history was more splendid than that of all others, seem to have been of all sovereigns most desirous that it should be extensively known. Pursuant to their desire, two histories in Latin of the discovery of India, and the conquests there, appeared about the same time, one by the Jesuit Maffæus, and the other, this work, by Oforio. The library of Oforio was carried off to England by the English fleet, on their return from Cadiz, in 1596. The Bodleian library was opened the ensuing year, and lord Essex gave sir Thomas Bodley a considerable part of this collection. Moreri. Gen. Biog.

OSORRO, in *Geography*, a town of Chili, in a district abounding with gold mines, 40 miles S.E. of Valdivia. S. lat. 40°. W. long. 73° 40'.

OSOSOR, a word used by some authors as a name for opium.

OSPEDALETTO, one of the four renowned confer-

vatorios at Venice, of which Sacchini was the master in 1770. The females educated there were all orphan girls; one of them, La Ferrarese, had a voice of uncommon compass at that time, as she was able to reach the highest E in our keyed-instruments, upon which she could dwell a considerable time, in a fair natural voice. But besides this natural power, she had been well taught, and was, in every respect, a very capital singer. We heard at this conservatorio a Latin oratorio, "Macchabæorum Mater," composed by Sacchini, in an exquisitely graceful and pathetic style. In the performance of this sacred drama, the Ferrarese gratified us still more in delivering an admirable accompanied recitative with such energy and feeling as are seldom heard.

OSPREE, in *Ornithology*. See FALCO *Offisfragus*.

OSRHOENE, in *Ancient Geography*, a small state of Asia, which occupied the northern and most fertile part of Mesopotamia, between the Euphrates and the Tigris. Under the Seleucidæ, a part of this country took the name of Mygdonia, with the title of kingdom. Polybius speaks of this kingdom in connection with Antiochus the Great. The capital of this kingdom was *Edeffa*; which see. The feeble sovereigns of Osrhoene, placed on the dangerous verge of two contending empires, were attached from inclination to the Parthian cause; but the superior power of Rome exacted from them a reluctant homage, which is still attested by their medals. After the conclusion of the Parthian war under Marcus, it was judged prudent to secure some substantial pledges of their doubtful fidelity. Forts were constructed in several parts of the country, and a Roman garrison was fixed in the strong town of Nisibis. During the troubles that followed the death of Commodus, the princes of Osrhoene attempted to shake off the yoke; but the stern policy of Severus confirmed their dependence, and the perfidy of Caracalla completed the easy conquest. Abgarus, the last king of Edeffa, (A.D. 216.) was sent in chains to Rome, his dominions reduced into a province, and his capital dignified with the rank of colony; and thus the Romans, about ten years before the fall of the Parthian monarchy, obtained a firm and permanent establishment beyond the Euphrates.

OSRUSHNAH, in *Geography*, a town of Turkestan, and capital of a district, to which it gives name; 65 miles N.N.E. of Samarcand. N. lat. 40° 30'. E. long. 64° 30'.

OSSA, in *Anatomy*, a technical term employed in speaking of the bones, particularly of the head, as ossa nasi, ossa spongiosa, &c. See BONE and Os.

OSSA, in *Geography*, a river of Prussia, which runs into the Vistula, 15 miles below Culm.

OSSABAW, an island in the Atlantic, near the coast of Georgia, 20 miles in circumference. N. lat. 31° 42'. W. long. 81° 17'. Between this island and Great Wallow is a channel, called Ossabaw sound. N. lat. 31° 43'. W. long. 81° 12'.

OSSÆI, or OSSENI, a name sometimes given to the Jewish sect of religion called Essenians.

OSSARA, in *Geography*, a town of Hindoostan in Mohurbunge; 18 miles N. of Harriopour.

OSSAT, ARNAUD D', *Cardinal*, in *Biography*, was born in 1536, of parents in humble life, at a village near Auch: he was left an orphan at an early age, and rose in the world wholly by his own merit and industry. Entering into the service of a young nobleman of the house of Marca, he studied with him, and in time became his preceptor. In 1559 he took his pupil, with two other young persons, to Paris, where he carefully superintended their education, at the same time taking care not to neglect his own studies. In philosophy he was a disciple of Ramus, and composed a

work in his master's defence. After he had made what he deemed sufficient progress in his legal studies, he practised at the bar in Paris, and was greatly admired for his masculine eloquence. He obtained the post of a counsellor in the presidial court of Melun: after this he went with Paul de Foix, archbishop of Toulouse, who had been nominated by Henry III. ambassador, to the court of Rome, as his secretary. After the death of that prelate, in 1584, Ossat took holy orders, and was received into the house of cardinal d'Este. The secretary of state, Villeroi, made him *Chargé des affaires* for the French court; and in this quality, at the beginning of Henry IVth's reign, he was highly serviceable in promoting the reconciliation of that king with the see of Rome. In 1598 he was honoured with a cardinal's hat, and in three years afterwards was made bishop of Bayeux. He died in 1604. He was a man of great penetration, and singularly prudent and circumspect in the management of affairs, so that it is said of him, that he never made a false step. He left behind him a great number of letters relative to the negotiations in which he was engaged, which are reckoned models of political sagacity. The best edition is that of Amelot de la Houffaye, in 1698, in two vols. 4to., and five vols. 12mo. Moreri.

OSSEGG, in *Geography*, a town of Bohemia, in the circle of Leitmeritz; 18 miles W.N.W. of Leitmeritz.

OSSELET, in the *Manege*, is a very hard excrescence, resembling a little bone, on the inside of the knee (and never on the outside), appearing to be of the same substance with the rest of the knee, and only distinguishable from the knee by its extending a little lower.

OSSENIGA, in *Geography*, a town of Italy, in the Veronese; 6 miles N. of Verona.

OSSERVANZA, Ital., in *Musica: con osservanza*, with care, attention, exactitude, in observing and executing with precision whatever is written or printed; without omissions or addition, which Corelli expresses by *come sta*, as it stands in the copy.

OSSIACH, in *Geography*, a town of Carinthia, on the lake Ossiacher; 4 miles S.W. of Feltkirchen.

OSSIACHER SEE, a lake of Carinthia, four miles long and two wide; 4 miles N.E. of Villach.

OSSIAN, in *Literary History*, a Celtic bard, who, as well as Fingal and other heroes whom he is said to have celebrated in his poems, is claimed both by the Highlanders of Scotland and the Irish. It is highly probable, that the name of Ossian and his heroes would have been confined to these people, had not Macpherson, about the middle of the last century, published two volumes of poems, as the genuine offspring of this Celtic bard. The circumstances which he stated, as having attended the discovery of these poems, and the nature and description of the poems themselves, excited strong suspicions of their authenticity, almost as soon as they were given to the world: the controversy to which these suspicions gave birth, contributed to render them known and popular; however, it would be unfair to deny, that their intrinsic merits, though certainly very much misrepresented and overrated, also obtained them popular applause and favour. There were also other circumstances, besides the singular and suspicious nature of their discovery and publication, and the poetic merits which they possessed, or were supposed to possess, which fixed on them the curiosity and interest of men of philosophy and literature. They exhibited a most uncommon and unparalleled picture of human manners; a picture, which, if it were drawn from nature, would confound all the principles which philosophy had deduced from the history of mankind: they also related events, not easily reconcilable to the authenticated history

of the country, where the scene was laid: on these accounts, the interest of almost all classes was fixed upon them; they were admired by the lovers of poetry, who, in their admiration, had not time or inclination to investigate their authenticity; while by those who viewed them more coolly and philosophically, and who could not permit themselves to admire, before they were convinced of their authenticity, strong and various objections were urged against their claim to be considered as the poems of Ossian. The interest which they excited was still farther increased, by the Highlanders taking up the question, both respecting their authenticity and their poetical merits, as one in which their honour and pride were immediately and deeply concerned: they could not tamely or quietly abandon the belief that Ossian wrote these poems; and when Macpherson was charged with having forged them, the firm conviction they had expressed of their authenticity, joined to the disgrace which, through Macpherson, they thought would fall on themselves, rendered them most obstinate in their original belief.

In this article it is proposed to examine whether Ossian and his heroes were Scotch or Irish; to fix, as nearly as possible, the period during which they flourished; to state the notices of his poems, which are scattered in ancient authors; to give an account of the search after them, which was made before the time of Macpherson; to relate the circumstances attending the publication of Ossian's poems by Macpherson; to point out the principal and most striking characteristics of these poems; and to conclude with an abstract of the controversy respecting their authenticity.

Although the claims of the Highlanders to Ossian and his heroes have been more urgent and repeated than those of the Irish, there is good reason for believing that the latter possess the greatest justice. There are numberless traditions in Ireland concerning the Fions, a species of militia, inhabiting Leinster, and commanded by Fin Mac Coul: that this Fin Mac Coul is the same as the Fingal of Macpherson is clear, from the identic name of the father, Cuwal, the son Oisín, and the grandson Oskir; and from the old Scotch poets, who sometimes call him Fingal, and sometimes Fin Mac Coul. Among the warriors of this ancient militia, the Irish traditions and histories hand down the names of Goll Mac Morn (Gaul the son of Morni) of Oscur the son of Oisín, evidently the Ossian of Macpherson, of Fergus O'Fillan, and other warriors. Ossian himself, also, is celebrated among the Fions. Besides these heroes, Irish traditions and ancient manuscripts mention a military order in Ulster of earlier date, the chief ornament and support of whom was Cuchullin. This evidence undoubtedly ascribes Ossian and his heroes to Ireland; but it is farther corroborated, even by the traditions and old songs and poems of the Highlands, though the passages in the latter, which describe Ireland as the native country of Ossian, Fingal, &c. have been altered for controversial purposes: it is needless to cite all these passages: the following, from Erse poems, collected in the Highlands by Dr. Young, bishop of Clonmore, and published in the first volume of the Irish Transactions, may suffice.

In the combat of Con, the son of Dargo, and Gaul son of Morne, the Fions are called "the noble Fions of Ireland:" this, in the Perth edition of this poem, is changed into "the nobles and great chieftains." In the combat of Osgar, and Illan son of the king of Spain, for "the Fions of Ireland," the Perth edition substitutes the "noble Fions." In a poem called the Death of Oscar, of which Macpherson made use in the first book of Temora, Ireland is expressly mentioned as the country of that prince: "The death of Oscar grieved my heart, our loss is great in the prince

prince of the chiefs of Ireland:" and in another poem on this subject, still current in the Highlands, Oscar is called the "prince of Ireland; the prince of the heroes of fertile Ireland." Even so late as the time of Gawin Douglas, Ireland seems to have been regarded as the country of Fingal and the other heroes of Ossian.

"Great Gow Mac Morn, and Fin Mac Coul, and how
They should be gods in Ireland, as men say."

There is another circumstance, which considerably strengthens the opinion that the Fions were natives of Ireland. No Highlander ever heard of Selma, except through the poems published by Macpherson; whereas, Almuin is pointed out by every old Irishman as the abode of Fingal: the name of this place occurs frequently in the poems which were collected in the Highlands by Dr. Young; it is always mentioned as the palace of Fingal; neither Selma, nor any other place of residence, is given in these poems to this hero; and it is worthy of remark, that Macpherson, in the use he has made of these poems, has either omitted altogether the name of Almuin, in order that no trace of Fingal's real country might exist, or changed it into Albin, in order to countenance the idea, that he was a native of Scotland; as will appear from the following passages; "Greater love seized all the heroes of Fin of Almuin." On this passage Dr. Young remarks: "The palace of Fin Mac Cumhal in Leinster, was seated on the summit of the hill of Allen, or, rather, as the natives of that country pronounce it, Allowin; the village and bog of Allen have thence derived their name. There are still the remains of some trenches on the top of the hill, where Fin Mac Cumhal and his Fions were wont to celebrate their feasts. The country hereabouts abounds in wonderful tales of the exploits of these ancient heroes. These two lines are omitted in the Perth edition." Irish Transactions, i. 76.

In the Dublin copy of the poem on the invasion of Ireland by Erragon, which Macpherson appears to have made use of in his battle of Lora, these words occur: "To Almuin in Leinster residence of the Fions, they took their voyage across the sea:" in this place, Macpherson has substituted the word Albin, though, as Dr. Young remarks, there can be no excuse for this alteration, "as the king of Lochlin is represented steering his fleet boldly to the coasts of Ireland, and challenging the heroes of Innisfail. The infidelity, therefore, of the queen of Lochlin could not be said to have been the cause of spilling Scottish blood, since the scene of the whole transaction is laid in Ireland, and they are the heroes of Innisfail who fell in battle."

As, therefore, the Irish traditions respecting the Fions are uniform and consistent; as, even in the poems which celebrate their exploits, and which are current and popular in the Highlands, many passages occur, in which Ireland is expressly mentioned as their native country; and as, besides, the palace of Fingal is a place not known in the Highlands, but still pointed out, at least by similarity of name, in Ireland, we are justified in concluding that Ossian and his heroes were natives of Ireland. This conclusion will be still farther strengthened if we examine the vague and inconsistent notices, which Scotch tradition and history records of Ossian and his heroes. Indeed, in Scottish history they were never heard of till Bruce claimed them as of Scotch extraction; for in the passages quoted by the Highland Society (in their Report on the Poems of Ossian), Fingal, and the other heroes of that bard, are mentioned, without any reference to the country of which they were natives. The Highland Society lay great stress on the proverbs which are current in the Highlands respecting Ossian, and the names of places corresponding

with the names of his heroes: *Ossian dale*, blind Ossian, is a person as well known there as strong Sampson, or wife Solomon: the very boys, in their sports, cry out for fair play, "the equal combat of the Fingalians:" and "Ossian, the last of his race," is proverbial to signify a man who has had the misfortune to survive his kindred. In answer to the queries, which were transmitted by the Highland Society, several of their correspondents mentioned the names of various places in their neighbourhood, tending to shew the universal ancient traditional belief of the existence of Fingal and his heroes. "Among many others were enumerated the well known cave of Staffa, first made known by the description of Sir Joseph Banks; the whirlpool, or gulf set down in Blair's Atlas Scotiæ, published A.D. 1662, called Coire Fin Mac Coul, or the Whirlpool of Fion, son of Comhal; and the hill in the isle of Sky, known by the name of Ait Suidh Fhinn, or Fingal's seat. Indeed there are few districts in the north-west of Scotland, where such instances may not be found." Report on the Poems of Ossian, p. 79.

But all these circumstances, even when collected and taken together, do not amount to a proof that Ossian and his heroes were natives of the Highlands of Scotland: they merely prove the antiquity of the tradition and belief respecting them. In Ireland, on the other hand, there are not only similar proverbial and local notices (if the expression may be allowed) of Ossian and his heroes; but there is historical evidence that the Fions were Irish, and the palace of their chief is still recognised and pointed out. None of the traditions, or genuine poems, preserved in the Highlands, which have reference to them, name or claim them as natives of that country: whereas, in several passages of the latter, they are clearly and expressly declared to have been natives of Ireland, and to have resided there, and there to have carried on their military exploits. But it may be asked, how happens it, if Ossian and his heroes were Irish, that the tradition of them is so strong and prevalent in the Highlands, the proverbial expressions relating to them so marked and numerous, and the places named after them so common: the solution of this difficulty is very easy: it is well known, that at the period when the Fions lived, the intercourse between that part of Ireland, where they are said to have resided, and the Highlands of Scotland, was frequent; and it is also highly probable, as will afterwards be shewn, that an Irish colony, nearly at, or immediately subsequent to this period, passed over to that part of the Highlands, where the traditions and notices of Ossian are most commonly met with.

It is not very easy, accurately and satisfactorily to fix the period when Fingal and Ossian flourished: the era which Macpherson assigns them must be given up. Later Irish MSS., traditions and poems, both in Ireland and the Highlands, represent Ossian as contemporary with St. Patrick; but if we may depend on the account of the Irish militias of Ulster and Leinster, Fingal must have succeeded St. Patrick nearly two centuries; and, consequently, his son Ossian could not have been contemporary with him. According to the Irish annals (on the authenticity of which, however, much stress ought not to be laid), Fingal flourished under Cormac O'Cuin, about the year 254. That Ossian was not contemporary with St. Patrick, is, however, most satisfactorily proved from Jocelin, a writer of the 12th century, in his life of that saint, who places Fin Mac Coul above a hundred years before him. Ossian and his heroes may, therefore, be placed about the end of the third and the beginning of the fourth century; and it may be inferred, that all poems which refer them to a later period, are not the

the genuine poems of Ossian. It will be proper to keep this remark in our recollection when we come to discuss the authenticity of the poems which have been ascribed to this bard.

There are scarcely any notices respecting these poems to be found in old authors, who treat either of Ireland or of Scotland: the bards or seanachies of the latter country do not trace up their kings to the Fions, or heroes of Fingal, but to the Dalriadic monarchs. At the coronation of Alexander III. a Highland genealogist is introduced by Fordun to recite the royal pedigree, but instead of ascending from Fergus Mac Erth, to Erth Congal, Fergus, Fingal, and from thence, according to Ossian, to Comhal, Trahal, and Trenmor, he proceeds through the whole race to Fergus I., a sufficient proof, that there was no tradition then of the six kings of Morven, nor any poems, which treated of the exploits of Fingal and his heroes. Had these poems existed in the time of Monro, dean of the Isles, he would have appealed to them in his genealogy of the clans. Buchanan indeed, in his account of the family of Buchanan, mentions the Militia of Fin, and speaks of "rude rimes," on the actions of Fin Mac Coul, as retained by the Irish and Scottish Highlanders. There is, however, a passage in bishop Carlwell's introduction to his translation of the Forms of Prayer, into Gaelic, printed at Edinburgh in the year 1567, which is quoted in the report of the Highland Society, in order to give an idea of the general impression and delight, which the recital of the poems or ballads (of Ossian) produced among the inhabitants of the Highlands, which it may be proper to consider: in this passage the bishop complains, that "great is the blindness and sinful darkness, and ignorance, and evil design of such as teach, and write, and cultivate the Gaelic language, that with a view of obtaining for themselves the vain reward of this world, they are more desirous and more accustomed to compose vain, tempting, lying, worldly histories, concerning the *Tuatha de dannan*, and concerning warriors and champions, and Fingal the son of Cumhall, with his heroes, and concerning many others, which I will not at present enumerate or mention, in order to maintain or reprove, than to write, and teach, and maintain the faithful word of God, and of the perfect way of truth." Now this passage, cited by the Highland Society, in order to prove the currency and popularity of Ossian's poems, actually proves, that the bards were accustomed, in the time of bishop Carlwell, to compose poems concerning Fingal, which poems were probably in subsequent ages considered as the genuine poems of Ossian.

The first person who seems to have conceived the idea of collecting the poems and ballads of the Highlands, was a young man, Jerome Stone of Dunkeld, who had acquired a knowledge of the Gaelic language. Of one of the poems, which he collected, he published a translation in rhyme, in the Scotch Magazine for January 1756. Nearly about the same time Mr. Pope, minister of Reay in Caithness, entertained the design of making a collection of the ancient poetry of the Highlands; but in consequence of the death of the gentleman who engaged with him in this undertaking, he seems to have dropped it very soon.

The next collector of Gaelic poetry was Mr. James Macpherson. In the year 1759, Mr. Home, the author of Douglas, met him at Moffat; in the course of a conversation on the manners of the Highlands, Macpherson informed him that one of their favourite amusements "was to listen to the tales and compositions of their ancient bards, which he described as containing much pathos, and poetical imagery, and at Mr. Home's desire, he translated some fragments, which his memory served him to recollect. The

beauty of these fragments struck Mr. Home, and his friends at Moffat, to whom he communicated them, so forcibly, that they prevailed on Mr. Macpherson, who was rather averse to the undertaking, to publish them in a small volume at Edinburgh, of which they agreed to superintend the publication, and defray the expence." Report of the Highland Society on the Poems of Ossian, p. 27.

This small volume contained the opening, and some episodes of Fingal; and an intimation was given, that if it were favourably received, the whole of Fingal might be recovered. A subscription was accordingly set on foot, to enable Macpherson to perform a tour through the Highlands to collect larger and more complete specimens of Gaelic poetry. When he returned to Edinburgh, he communicated to his literary patrons the result of his expedition; and soon afterwards, Fingal, an epic poem in six books, was published, along with some small detached pieces. In the year 1765, he published another epic poem, entitled "Temora." To one of the books of this poem, he annexed what he called the original Gaelic: but of the rest he only published the translations. At his death, however, he left 1000*l.* to defray the expence of the publication of the originals of the whole; on which publication we shall afterwards offer some remarks.

The success which had attended Mr. Macpherson's researches, and the fame which he had acquired by the publication of the poems of Ossian, incited several others to proceed into the Highlands, and to collect from tradition or manuscripts Gaelic ballads; while, as a suspicion of the authenticity of what Macpherson had published arose in the minds of many, enquiries were also set on foot, for the purpose, if possible, of detecting the supposed imposture. There is reason to believe, too, that some of the poems, which were given to the world, after the success and fame of Macpherson, were not genuine Gaelic poems, nor even founded on the traditionary ballads of the Highlands, but entirely the fabrication of those who published them.

In the year 1780, Mr. John Clark, land surveyor in Badenoch, published translations of Gaelic poetry; the principal of these was a regular poem, in three books; two of which were afterwards published in a verse translation by Mrs. Grant of Laggan. In the same year, Mr. Hill, in a tour through the Highlands, collected, chiefly from one Macnab, a blacksmith in Argyleshire, copies of several ancient poems: which from the incidents which they contain, and other internal evidence, must be deemed of a later date, than that which Macpherson is disposed to attribute to the poems which he published. Along with translations of these poems Mr. Hill gave the Gaelic original; and to the whole he subjoined remarks, on the authenticity of Macpherson's Ossian, which at that time had become the subject of keen controversy.

In the year 1786, a pretty large collection of Gaelic poetry of various dates was published at Perth: this volume contained several short ballads, similar in their subject to some of the poems published by Macpherson.

But the most voluminous collector of Gaelic poetry, since the time of Macpherson, was Dr. Smith, minister of Camptown in Argyleshire. In the year 1780, he published *Dissertations on Gaelic antiquities*, to which he annexed a collection of ancient poems, translated from the Gaelic of Ossian, Ullin, Oran, and others; and afterwards, in 1787, he published the originals. To his publication he subjoined an account of the manner in which he procured these originals.

In the year 1784, Dr. Young, afterwards bishop of Clonmore, made an excursion through the Scottish Highlands,

lands, for the purpose of collecting all the information in his power concerning the authenticity of Macpherson's Ossian. The result of his enquiries and investigation he gave to the world in the first volume of the Transactions of the Royal Irish Academy. It consisted of some rude ancient Gaelic poems respecting the race of the Fions, which we have already had occasion to notice and quote. These poems Dr. Young transcribed letter for letter from the copies current in the Highlands, except so far as they were corrected by the edition published at Perth. Dr. Young does not mention the apparent antiquity of the MSS. from which he transcribed these ballads.

These are the principal collections of Gaelic poetry which have been published, as preserved by tradition or in manuscripts, in the Highlands of Scotland. In Ireland a collection made its appearance soon after Macpherson's Ossian; this consisted of a translation in rhyme, by Miss Brooke, of some Irish ballads, which she supposes to be of a later date than that in which Ossian flourished, and probably of the eighth, ninth, and tenth centuries. Most of these Irish poems relate to the Fingalians; but they differ both in the incidents which they relate, and in their manner and style, from the poems under similar titles, which have been collected in the Highlands of Scotland. One most striking difference consists in the magical machinery of the Irish poems, instead of the mere reference to the belief of the employment and intervention of departed spirits, which the Fingalian poetry of the Highlands exhibits.

As the result of the researches of the Highland Society, which was given to the world in their report into the nature and authenticity of the poems of Ossian, will fall more properly under our notice, when we come to discuss that authenticity, we shall proceed to point out the most striking characteristics of these poems.

On the first perusal of these poems, the reader is struck with their obscurity; he finds it necessary to pause and reflect, before he can ascertain the meaning of many passages, or perceive and trace the connection of the narrative. Even after he has become accustomed to the style, he is obliged to leave in despair many parts as absolutely unintelligible, or at least as conveying no clear and distinct idea or image to his mind; besides this great fault, the poems labour under the imputation of being excessively bombastic and turgid; so that a reader of taste and judgment has several difficulties to overcome, before he can sit down to their perusal, in such a state of mind and feeling, as will permit and enable him calmly and impartially to appreciate their merits. And even after he has got over the repugnance excited by their obscurity and bombastic style, he will be in danger of being repelled and disgusted by their sentimental effusions, which, in many instances, are of the most romantic and sickly character. Still, however, there is something in the poems which gets the better of all these objections; and which is more powerful in its attractions, than the faults which we have noticed are in their repulsive quality. The great characteristics of Ossian's poetry, are undoubtedly, as Dr. Blair remarks, tenderness and sublimity; but the tenderness is pathetic, melancholy, and solemn; and the sublimity is dreary, desolate, and gloomy. There is nothing gay or cheerful; the mind of the reader is prepared for the grave and solemn events which they record, by the wild and romantic scenery which they describe. "The extended heath by the sea-shore; the mountain shaded with mist; the torrent rushing through a solitary valley; the scattered oaks and the tombs of warriors overgrown with moss;—all produce a solemn attention in the mind, and prepare it for great and extraordinary events."

The following passages may be cited as instances of the sublime.

"As autumn's dark storms pour from two echoing hills, so toward each other approached the heroes. As two dark streams from high rocks meet and mix, and war on the plain: loud, rough, and dark in battle, met Lochlin and Innisfail: chief mixed his strokes with chief, and man with man. Steel clanging, founded on steel. Helmets are cleft on high: blood bursts and smokes around. As the troubled noise of the ocean, when roll the waves on high; as the last peal of the thunder of heaven; such is the noise of battle. The groans of the people spread over the hills. It was like the thunder of night, when the cloud bursts on Cona, and a thousand ghosts shriek at once on the hollow wind."

The sublimity of the following passages is of a solemn and awful character:

"A dark red stream of fire comes down from the hill. Crugal fate upon the beam: he that lately fell by the hand of Swaran, striving in the battle of heroes. His face is like the beams of the setting moon. His robes are of the cloud of the hill. His eyes are like two decaying flames. Dark is the wound of his breast. The stars dim twinkled through his form; and his voice was like the found of a distant stream."

"Dim and in tears he stood, and stretched his pale hand over the hero; faintly he raised his feeble voice, like the gale of the reedy Lago. My ghost, O Connal! is on my native hills; but my corpse is on the sands of Ullin. Thou shalt never talk with Crugal, or find his lone steps in the heath. I am light as the blast of Cromla; and I move like the shadow of mist. Connal, son of Colgar, I see the dark cloud of death. It hovers over the plains of Lena. The sons of green Erin shall fall. Remove from the field of ghosts. Like the darkened moon he retired, in the midst of the whistling blast."

The following are instances of the other striking characteristic of Ossian's poetry, tenderness;—Gaul, the son of Morni, and the lover of Oithona, ignorant of the misfortune which had befallen her, comes to her rescue, and proposes to engage her foe in single combat.

"And shall the daughter of Nuath live," she replied with a bursting sigh: "Shall I live in Tromathon, and the son of Morni low? My heart is not of that rock; nor my soul careless as that sea, which lifts its blue waves to every wind, and rolls beneath the storm. The blast which shall lay thee low, shall spread the branches of Oithona on earth. We shall wither together, son of car-borne Morni. The narrow house is pleasant to me; and the grey stone of the dead; for never more will I leave these rocks, sea-surrounded Tromathon. Chief of Struman, why camest thou over the waves to Nuath's mournful daughter? Why did I not pass away in secret, like the flower of the rock, that lifts its fair head unseen, and strews its withered leaves on the blast? Why didst thou come, O Gaul, to hear my departing sigh? O had I dwelt at Davranna, in the bright beams of my fame. Then had my years come on with joy; and the virgins would bless my steps. But I fall in youth, son of Morni, and my father shall blush in his hall."

"No father mourned his son slain in youth; no brother, his brother in love; they fell without tears, for the chief of the people was low."

"And is the son of Semo fallen? said Carril with a sigh. Mournful are Tura's walls, and sorrow dwells at Dunfaich. Thy spouse is left alone in her youth: the son of thy love is alone. He shall come to Brapla, and ask her, why she weeps. He shall lift his eyes to the wall; and see his father's

father's sword. Whose sword is that? he will say: and the soul of his mother is sad."

The melancholy tenderness of Ossian's poetry is also displayed in the following passage, in which the bard contrasts his present and his former state.

"Such were the words of the bard in the days of the song; when the king heard the music of harps, and the tales of other times. The chiefs gathered from all their hills, and heard the lowly sound. They praised the voice of Cona: the first among a thousand bards. But age is now on my tongue, and my soul has failed. I hear sometimes the shouts of bards, and learn their pleasant song. But memory fails on my mind; I hear the call of years. They say, as they pass along, why does Ossian sing? soon shall he lie in the narrow house, and no bard shall raise his fame. Roll on, ye dark brown years; for ye bring no joy in your course. Let the tomb open to Ossian, for his strength has failed. The sons of the song are gone to rest. My voice remains like a blast, that roars lonely on a sea-furrounded rock, after the winds are laid. The dark mofs whistles there, and the distant mariner sees the distant trees."

Besides the sublime and tender passages with which the poems of Ossian abound, they are distinguished by their strong and lively descriptions, in which, often by a single circumstance, the picture is rendered most natural and impressive; the genius of the poet too lends to these descriptions all that interest, which pathetic reflection or tender feeling can bestow; he seldom contents himself with the mere description of natural scenery, without intermixing these peculiar traits of his disposition and genius: this remark is most particularly exemplified in the following passage.

"I have seen the walls of Balclutha, but they were desolate. The fire had resounded within the halls; and the voice of the people is now heard no more. The stream of Clutha was removed from its place, by the fall of the walls; the thistle shook there its lonely head; the mofs whistled to the wind. The fox looked out of the window: the rank grafs waved round his head. Desolate is the dwelling of Moira. Silence is in the house of her fathers."

We have room to particularise only one more of the excellencies of Ossian's poetry; that is, the skill and effect with which he manages his similes: the following is an instance.

"Wilt thou not listen, son of the rock, to the song of Ossian? My soul is full of other times; the joy of my youth returns. Thus the sun appears in the west, after the steps of his brightness have moved behind a storm. The green hills lift their dewy heads. The blue streams rejoice in the vale. The aged hero comes forth on his staff; and his grey hair glitters on the beam."

On the whole, the merits of Ossian's poetry must be allowed to be great; it has also great faults: to those whose judgment and taste have been disciplined by study, and formed on the models of antiquity, the faults will seem to counterbalance the beauties; but in the opinion of the multitude, the beauties will preponderate, and with them the poems of Ossian will always be popular.

Almost as soon as the poems of Ossian were given to the world by Macpherson, doubts were raised concerning their authenticity; and these doubts were increased and strengthened by the strange and perverse conduct of that gentleman: he pretended to have collected manuscripts in the Highlands, from which he had translated these poems; to have these manuscripts, of undoubted antiquity as he maintained, in his possession; and yet, when the poems were branded as forgeries, instead of silencing the sceptics and

accusers by the production of these manuscripts, he maintained a fullen and obdurate silence. Besides the unwillingness or inability of Macpherson to produce the manuscripts which he asserted he had discovered in the Highlands, or to name the persons from whom he had received them, there were other suspicious circumstances affixed to these poems. The literati of England, and in an especial manner Dr. Johnson, pronounced them forgeries; and the latter was confirmed in his opinion (if confirmation he needed) when, in his journey through the Highlands, he could collect only very vague, general, but most peremptory and positive assertions, that the poems published by Macpherson were authentic, and had been well known there for generations. The controversy concerning their authenticity, however, did not proceed to any length, or assume any regular and methodical form till the year 1800, when Mr. Malcolm Laing published his History of Scotland; to the second volume of this history he annexed a learned, most acute, and ingenious dissertation on Ossian's poems. In any controversy which had been agitated on this subject, before Mr. Laing took it up, the whole jet of the argument and proof lay on the existence, in tradition or manuscript, of poems in the Highlands, composed by Ossian, and similar in all their leading features to those published by Macpherson: the internal evidence, though generally mentioned by the disbelievers in their authenticity as strongly in favour of their opinion, was never minutely and thoroughly examined, before Mr. Laing investigated it. The objections to the authenticity of these poems may be thus stated and arranged.

1. It is highly improbable, that at the time when Ossian lived, he could compose such long and regular poems, without the use and assistance of letters; and the most sturdy and zealous advocates for these poems, will not contend that letters were known in the Highlands in the third century. It may indeed be urged, that Homer composed his Iliad and Odyssey, when he was equally a stranger with Ossian to the use of letters; but of this assertion there is no proof; the presumption on the contrary is, that in the time of Homer, letters were known in Greece. It is scarcely necessary to dwell on the position here laid down, that if letters were unknown in the Highlands in the time of Ossian, that bard's compositions must have been very short, and probably very irregular; certainly not of the description of poems which Macpherson published in his name, and which Dr. Blair, in his Dissertation, has proved to be written in exact conformity to the rules which Aristotle lays down for the composition of an epic poem.

2. Even allowing that such long and regular poems could have been composed without the use of letters; it is not credible, that they could have been transmitted from the time of Ossian to the time of Macpherson, or at least to the time of the date of the most ancient manuscripts found in the Highlands. This objection cannot be put in a stronger way, than in the words in which Hume has expressed it, in a letter to Gibbon. "It is indeed strange, that any man of sense could have imagined it possible, that above 20,000 verses, along with numberless historical facts, could have been preserved by oral tradition, during fifty generations, by the rudest, perhaps, of all civilized nations, the most necessitous, the most turbulent, and the most unsettled." There is nothing similar to this in any other language, or among any other nation: the Gothic poems are all short; the death song of Radnor Lodbrog, which is amongst the longest pieces of Gothic poetry, supposed to be traditionally preserved, extends but to twenty-nine octavo stanzas, of short lines; and in order to relieve the memory in this and other Gothic poems, there is always a burden. Besides, these

ballads were written only a few centuries before letters were common among the Gothic nations; and consequently, their preservation (independently of the circumstance of their shortness) cannot be considered as in the least similar to the supposed preservation of Ossian's poems.

When Macpherson first published his fragments in 1760, in order to prove their antiquity, he asserts, that "the diction is very obsolete, and differs widely from the style of such poems, as have been written in the same language two or three centuries ago;" and the Highland Society, in their Report, make use of a similar argument: "no modern could possibly write such Gaelic as the original given by Macpherson, in his *Temora*, any more than the best Greek or Latin scholars could write what would pass itself, on persons conversant in those languages, for the composition of Homer or Virgil;" and yet, in the same Report, it is stated, that the language in these poems is nearly what it still is in the common use and understanding of the country. These assertions evidently contradict one another; but let the believers in the authenticity of Ossian's poems choose which they please, it will equally militate against their belief. If the Gaelic of Ossian's poems, as published by Macpherson, is the Gaelic in the common use and understanding of the country at this day, then it is Gaelic, which might have been written by him; and the poems might have been forged by him; and the argument for their authenticity falls utterly to the ground: if, on the other hand, the Gaelic of these poems is such as no modern could possibly write, then they could not have been transmitted, either in manuscript or tradition; for, as Mr. Laing observes, "that the poems were preserved by oral tradition, in an obsolete diction, or, in other words, a dialect already disused by the people, is alone sufficient to confute their authenticity." If the poems are still current and popular in the Highlands, they must be understood; if understood, they must be written in a language familiar and similar to modern Gaelic; and if written in this language, they might have been forged.

3. The poems of Ossian, as published by Macpherson, are very dissimilar, in their sentiments and character, from other poems written in the same state of society. Dr. Blair, in his *Critical Dissertation*, after quoting the funeral song of Radnor Lodbrog (already referred to) observes, "this is such poetry as we might expect from a barbarous nation; it breathes a most ferocious spirit. It is wild, harsh, and irregular; but at the same time animated and strong: the style in the original, full of inversions, and as we learn from some of Olaus' notes, highly metaphorical and figured. But when we open the works of Ossian, a very different scene presents itself. When we turn from the poetry of Lodbrog to that of Ossian, it is like passing from a savage desert to a fertile and cultivated country." It might have been supposed, that the utter dissimilarity between the poetry of Ossian, and that of the Gothic nations, at nearly the same era, would have excited suspicions in the mind of Blair, respecting the authenticity of the former; instead of that, he enters into a learned disquisition to prove, that the Celtic nations were much more refined and civilized than the Goths; and that this superior refinement and civilization were owing to the establishment of the Druids among them. Let us grant, for a moment, that the Celtic nations were thus distinguished above the Goths; still this will not account for the character of Ossian's poetry; no state of society, but that in which very refined and subtle feelings are indulged, in which what may be styled the luxury of sentiment is known, could have produced such poems as those which were published by Macpherson. The Celts, if they were farther advanced in knowledge and civilization than the Goths, might have

produced poetry free, in a great measure, from that ferocious spirit, and from that wildness, harshness, and irregularity, which Blair notices in the death song of Radnor Lodbrog; but it would still have retained many of the marks of a barbarous age. But the poetry of Ossian, as published by Macpherson, is not only unlike that of the Goths, but it is as unlike that Gaelic poetry, which is known to be genuine. The latter, as given to the world by Dr. Young, the Highland Society, &c. agrees in every respect with the idea which has always been entertained of the poetry of a rude people; the style of it is very unequal; "sometimes tame and flat; sometimes turgid and highly periphrastic: sometimes it rises into savage energy, and sometimes melts into natural tenderness." The manners exhibited in this genuine Gaelic poetry, also, are such as might be expected in a savage nation: in one of the poems given in the appendix to the Report of the Highland Society, Fingal knocks Carril on the head for disputing with him the property of a beef flake, dressed with onion sauce. Unless, therefore, we can bring ourselves to believe, that in the third or fourth century the Highlanders were superior in knowledge, refinement, and delicacy of feeling and sentiment, not only to their Gothic contemporaries, but even to most European nations at the present time; and that they afterwards became savage and unenlightened, we must doubt the authenticity of Ossian's poems.

4. The omission of religion, and of all specific and circumstantial notice of the manners and customs of the age, is a strong presumption against their authenticity. Macpherson was ignorant of the gods and rites of the Caledonians: according to his historical theory, the Druids had been expelled by the Fingalians; and it was not therefore to be supposed, that the latter would adopt the religion of the former: he had, therefore, no other alternative but to fill his poems with ghosts; in which there is no proof that the Celts believed, and which are not to be traced in any of the authentic Gaelic ballads. There is no source more ample and more accurate, from which the manners, customs, and mode of life of ancient nations can be drawn, than from their ballads: but on these points Ossian's poems preserve a guarded and suspicious silence. In the time of Macpherson's heroes, hunting was the principal amusement; and yet the wild cattle, the wolves, and the boars, are never mentioned.

5. The inconsistency of the events related in these poems, with the Roman history of Britain, and with the history of the middle ages, has been very able pointed out by Mr. Laing as one proof of their forgery. "The arrival or return of the Scots from Ireland, under Fergus Mac Erth, and his brother Loarn, is established by the concurrence of every Scottish and Irish historian; and their first arrival is marked by Bede, under Riada their leader, from whom their settlement was named Dalriada:" hence it is an historical fact, that there was not a Highlander in Scotland of the present race, at the beginning of the era assigned to Fingal. This observation will derive great additional weight, if we have proved that Fingal and his heroes belong originally to Ireland, and consequently, were probably introduced to the knowledge of the Highlanders, at the era of the Dalriadic settlement in Scotland. Fingal, in the poems published by Macpherson, is connected with Caracalla in 208, and with Carausius in 286; and his reign and exploits are prolonged in the *Temora* to the battle of Gabhra in 296; "with the same propriety (Mr. Laing observes), as if a youthful patriot, who resisted a union in the Scotch parliament, were again introduced at the end of the century, opposing a union with Ireland, in the British senate." Caracalla, the son of Severus (to use the words of Gibbon) "is described

described by a nick-name invented four years afterwards, scarcely used by the Romans till after the death of that emperor, and seldom employed by the most ancient historians:” an awkward and unsatisfactory attempt has been made to get rid of this objection, by observing that Caracul, in Gaelic, means fierce-eyed. The Roman province of Valentia, into which Fingal is represented as having made an incursion, did not then exist; and Dumbarton, which is mentioned in the poems, was not then built; Lochlin was certainly unknown in the third century, notwithstanding Dr. Graham, in his reply to the objections of Mr. Laing, controverts this position, on the very doubtful authority of a MS. described by Dr. Donald Smith; and Orkney, in which Innistère is placed, if credit is given to the precise assertion of Solinus, rather than to the rhetorical period of Tacitus, was then uninhabited. It is unnecessary to go through the historical detections drawn from the middle ages; they are equally numerous and decisive; and are given with great acuteness and learning by Mr. Laing.

6. In opposition to these strong presumptions against the authenticity of Ossian's poems, and to the internal evidence of their modern date, it would require the most unequivocal and full proof, that they had been actually collected by Macpherson from tradition, or copied from ancient manuscripts, in order to silence scepticism. But this proof is miserably deficient, and, according to the acute observation of Mr. Laing “negative evidence with respect to the authenticity, becomes positive evidence with respect to the forgery of the poems.” It appears from various letters published in the Report of the Highland Society, that Macpherson, during his tour through the Highlands, visited several people who were said to possess MSS., or who were conversant in Gaelic poetry; that he asserted he had been very successful in the pursuit of his object; and that to several he shewed some of the MSS. which he had procured, and from them translated passages, which are stated to have been similar to what he afterwards published. But this testimony is very vague and unsatisfactory: the specific passages are not pointed out; the MSS. which Macpherson shewed were not examined. In short, the testimony afforded by these letters, is exactly of that sort against which Dr. Johnson protested: he found in the Highlands, many who maintained, that they were perfectly acquainted with Ossian's poems before the time of Macpherson; but he could get no direct and explicit answer, when he asked which of the poems, or requested them to point out exactly the passages with which they had been previously acquainted.

With respect to the MSS. said to have been procured by Macpherson, he always refused to produce them, except one, which Mr. Laing examined, and which, instead of being a MS. of Ossian's poems, is an Irish MS. in a character and language, which scarcely any Highlander can distinctly read; and which, as far as it has been made out, contains no poems either of Ossian, or of any other bard. It has been already mentioned, that Macpherson left a sum of money for the purpose of publishing his Gaelic MSS. after his death; from some cause or other, their publication was delayed till the year 1807, when they appeared with a literal translation into Latin, by the late Robert Macpherson, A.M., together with a dissertation on the authenticity of the poems, by Sir John Sinclair; a translation on the abbé Cefarotti's Dissertation on the Controversy, with notes, and a supplemental essay, by Dr. Mac Arthur; the work was published under the sanction of the Highland Society of London. The editors of this work thought that they should decide the controversy; but there were certain awkward and troublesome questions asked: the Gaelic poems thus published,

were all in Macpherson's hand-writing; what had become of the MSS. which he pretended to have got in the Highlands, and from which, if they really existed, he must have made his copy? To this no satisfactory answer can be given. On the margin of the first edition of his Ossian, Macpherson marked, with his own hand, the time when the Gaelic was delivered to Mr. John Mackenzie, the secretary to the Highland Society; among these memoranda, the following are found, “delivered the three Duans of Cathlode, as *complete as the translation.*” Does not this expression warrant the belief that the Gaelic was written after the English; else why say, as complete as the translation? It would be natural and proper to talk of a translation being as complete as the original; but to speak of an original being as complete as the translation, would scarcely have occurred to any one, whose thoughts and language had not been at direct variance. Again, he says, “delivered all that could be found of Carthon;” but, if the English Carthon had been the translation, why could he find little more than half the original from which the translation was made? The mere circumstance of the poems of Ossian being published in Gaelic, from MSS. in Macpherson's hand-writing, can prove nothing in favour of their authenticity; nor be a satisfactory answer to those who called for MSS., before they would give up their scepticism; unless there had been satisfactory evidence, that this Gaelic Ossian had been copied from old MSS.; for Macpherson could forge poems, as well in Gaelic as in English; and the undoubted facts, that he never would shew any old MSS.; that he delayed publishing the Gaelic during his life-time, and that he was very slow in delivering it over to those to whom he committed the publication, confirm the suspicion of Mr. Laing, that he *translated* his English Ossian into Gaelic, and that this translation he left for publication after his decease.

7. Macpherson published a poem called the Highlander, before he appeared as the translator of Ossian's poems: the similarity between the Highlander and Ossian in description, sentiment, manner, and style, is uncommonly striking and close; indeed Mr. Laing has proved that many passages of the former were transcribed by Macpherson into his Ossian. In a work published by Mr. Laing subsequently to his Dissertation, he has detected in the poems of Ossian many palpable and gross plagiarisms from Homer, Virgil, and their two translators; Milton, Thomson, Young, Gray, Macon, Home, and the English bible. Several of the instances given by Mr. Laing are undoubtedly strained, and would never have been brought forward as proofs of plagiarism, by a mind not warmed by a generous indignation against imposture; but most of them are of such a nature, as can leave no doubt that Macpherson, in the composition of Ossian's poems, either copied the authors we have mentioned, or was so fully imbued with their spirit, that even his own thoughts and expressions assumed the shape of theirs.

8. Macpherson, in various passages of his prefaces and introductions, seems disposed to acknowledge the imposture, and to claim the higher merit of an original poet: in one place he says, “Those who alone are capable of transferring ancient poetry into a modern language, might be better employed in giving originals of their own, were it not for that wretched envy and meanness, which affects to despise contemporary genius. I assure my antagonists, I should not translate what I could not imitate:” and in his preface he says, “without *increasing* his genius, the *author* may have improved his language, in the eleven years that the poems have been in the hands of the public.” And again, “in a convenient indifference for a literary reputation, the author hears praise without being elevated, and ribaldry without

out being depressed :” and in the conclusion he says, “ the translator, *who cannot equal his original*, is incapable of expressing its beauties.” These passages, if taken by themselves, would perhaps prove but little; but when considered in connection with all the other suspicious circumstances; with Macpherfon’s inability to produce any ancient MSS.; with the plagiarisms contained in the poems; and with the internal marks of forgery which they display; they tell strongly against their authenticity. But there is more direct and positive proof that Macpherfon confessed the imposture: the late venerable bishop of Dromore, in a letter to a friend (quoted by the British Critic, for 1809, p. 275.) says, “ I repeatedly received the most positive assurances from sir John Elliot, the confidential friend of Macpherfon, that all the poems, published by him, as translations of Ossian, were entirely of his own composition. This I did not understand so strictly as that Macpherfon might not have introduced some fragments of ancient Erse poetry, preserved by tradition; but that he had no genuine originals of Ossian’s composition. This, sir John Elliot did not communicate to me as the result of one single conversation, but what he was fully assured of, by repeated conversations, during the intimacy of many years.”

9. In the year 1797, the Highland Society of Edinburgh appointed a committee to enquire into the nature and authenticity of the poems of Ossian. By the direction of this committee, queries very distinctly and accurately worded, were transmitted to every one, who from personal knowledge, or opportunities of enquiry, was supposed capable of throwing light on the subject. In 1805, the report of this committee was published, sanctioned by the name of Mr. Henry Mackenzie, chairman. The line of conduct pursued by the committee was very similar to that which had been chalked out by Hume, in a letter to Blair, soon after the first appearance of the poems of Ossian by Macpherfon. Dr. Blair had written to Hume respecting the reception, in England, of his dissertation on these poems: Mr. Hume, in his answer, mentions the general incredulity of the English literati on their authenticity, arising partly from the behaviour of Macpherfon, who refused to satisfy any one who doubted of his veracity, and partly from the extreme improbability that such long connected pieces should have been preserved by oral tradition for fourteen centuries. Mr. Hume there points out the line of conduct which it would be necessary for Dr. Blair to pursue, if he wished to silence this general scepticism: “ the testimonies may, in my opinion, be of two kinds. Macpherfon pretends that there is an ancient MS. of part of Fingal in the family, I think, of Clanranold; get that fact ascertained by more than one person of credit: let these persons be acquainted with the Gaelic: let them compare the original and the translation; and let them testify the fidelity of the latter. But the chief point in which it will be necessary for you to exert yourself will be, to get positive testimony from many different hands, that such poems are vulgarly recited in the Highlands, and have there been long the entertainment of the people. This testimony must be as particular as it is positive. It will not be sufficient that a Highland gentleman or clergyman say, or write to you that he has heard such poems: nobody questions that there are traditional poems in that part of the country, where the names of Ossian and Fingal, and Oscar and Gaul, are mentioned in every stanza. The only doubt is, whether any of these poems have any farther resemblance to the poems published by Macpherfon. Generality must be carefully guarded against, as being of no authority.”

It is evident from these precautionary directions that Mr.

Hume was well aware of the loose and unsatisfactory evidence which most probably would be produced in support of the authenticity of Ossian; and the Highland Society, notwithstanding they transmitted very clear, precise, and distinct queries, received, in most cases, only very general answers: such was the impatient zeal, or such the clouded understandings of the Highlanders on this subject, that they either would not permit themselves to reply to any objections with an appeal to facts, or they misapprehended the question, and supposed it was the existence of traditionary poetry respecting Ossian and Fingal, and not the fidelity of Macpherfon’s translation, on which they were requested to give evidence. The consequence was, that much of the evidence produced on the report of the Highland Society, is quite exceptionable, on the grounds which Hume states and wishes to guard Dr. Blair against; and the evidence which goes to the point, only confirms that scepticism which it was intended to remove; since it only proves that there were in the Highlands MSS. and traditionary ballads, respecting Fingal and his heroes, attributed to Ossian, of which ballads Macpherfon had made use, but which were *not* the originals of his poems.

In the report it is expressly admitted, “ that the committee has not been able to obtain any one poem the same in title and tenor with the poems published by Macpherfon.” This admission is sufficient to put the seal upon the question of their forgery. The Highland Society, after this admission, should have disdained the unworthy and ridiculous substitute to which they have had recourse in order to make out something like an original for some of Macpherfon’s poems. The language of Mr. Laing in the following paragraph, though stern and harsh, is but too applicable to this disingenuous expedient.

“ Instead of complying with this plain and pointed requisition, the committee of the Highland Society employed the late Dr. Smith to collect such passages from these MSS. as might bear or acquire a remote affinity to Macpherfon’s Fingal. For this purpose thirteen or fourteen modern MSS. were taken, containing many hundred pages, and consisting of different collections of Erse and Irish poems. From this extensive range, between twelve and fifteen hundred detached lines are selected, and pieced together with the most preposterous diligence, in order to present to the reader, by dint of translation, something like the plan and outlines of Fingal. No intimation is given of the particular songs or poems from which they are taken; but the references to the different pages are as desultory as the lines themselves are unconnected and detached.” Mr. Laing then gives some specimens of this mode of piecing poetry together; and concludes with this remark: “ This, if practised in any other language than Erse, would be deemed fabrication.” This patch-work poetry has been happily likened to the expedient of brother Martin, in the Tale of a Tub, to discover authority in his father’s will for wearing shoulder-knots: as they were not expressly mentioned, he sought them first, *totidem verbis*, then *totidem syllabis*; and at last, all failing, *totidem literis*.

There can be no doubt that Macpherfon collected Gaelic poetry, and made use of it in his Ossian; but his materials were few and scanty, and of a very different character, in every respect, from the poems which he constructed from them. Fingal is principally founded on a ballad narrating the invasion of Ireland, by Magnus the Bare-footed: this ballad contains about fifty stanzas of four lines each; which Macpherfon has enlarged into six books, and thrown into the form of a regular epic poem. The story of the ballad bears some resemblance to that of Fingal; but in the former
there

there is no mention of the battle between Cuthullin and Sivarán, nor of those circumstances related by Macpherson in such detail, and by means of which he has swelled Fingal into six books. Besides this ballad of Magnus, Macpherson, in the composition of his Fingal, has made use of other small genuine pieces of Celtic poetry.

The battle of Lora, the next piece for which any authority has been discovered, is founded on a poem called Erragon: the incidents are nearly the same, but the manner of relating them, the sentiments and the language, are extremely unlike; and these sufficiently prove, that the peculiarities of Ossian's poetry are, in fact, the offspring solely of Macpherson's muse.

Carthor, the next poem, is founded on the tale of Conloch, natural son of Cuthullin, who being educated in Scotland, comes to Ireland, encounters his father there, without being known to him, and is slain by him. Macpherson has altered the incidents in some respects; and as usual, substituted his own sentiments and language. There is good reason for supposing that the famous address to the sun, with which this poem concludes, is not genuine. No Gaelic original has been discovered for the death of Cuthullin. Dearthula is well known in the Highlands under the name of *Devidre*; but Macpherson has very materially altered the story. The ballad of Lammon Mor seems to have been the foundation of Macpherson's "Luthmon;" but in the latter the story is told differently; and the night attack by Ossian and Gaul, with the imagery which Blair extols, are not in the ballad. For the first book of Temora there is some authority, in a poem celebrating the fatal battle of Gabhra, in which Osgur and most of the Fions were slain: as, however, Macpherson intended, when he published the first book of Temora, to add a second, he has omitted this catastrophe; and the Fions still live and fight. Such are the slender materials on which Macpherson constructed the pieces contained in his first publication: for those contained in his second volume, no genuine authorities can be found.

The result, therefore, of the enquiries of the Highland Society, must be considered as having finally and completely settled the question respecting the authenticity of Ossian's poems. As published by Macpherson, they are much more his own, even in incidents, and most especially, in sentiment, imagery, and language, than the composition of Ossian or any Celtic bard; and the ballads which he employed in their construction, or such as exist in MS. or in tradition in the Highlands, can on no positive or probable evidence be ascribed to Ossian; nor indeed traced up to any particular bard or era.

If further information is wanted on this subject, the following works may be consulted; "Laing's Dissertation on Ossian's Poems," annexed to the second volume of his History of Scotland. "The Poems of Ossian, &c. containing the poetical works of James Macpherson, esq. in prose and rhyme, with notes and illustrations;" by the same author. "Report of the Committee of the Highland Society of Scotland, appointed to enquire into the nature and authenticity of the Poems of Ossian, drawn up according to the directions of the Committee by Henry Mackenzie, esq. with a copious appendix, containing some of the principal documents on which the account is founded." "The Poems of Ossian in the original Gaelic, with a literal translation in Latin, by the late Robert Macpherson, A.M., together with a dissertation on the authenticity of the Poems, by sir John Sinclair, bart. &c. published under the sanction of the Highland Society of London." And "Essays on the Authenticity of the Poems of Ossian, in which the objections of Malcolm

Laing, esq. are particularly considered and refuted by Patrick Graham, D.D." &c.

Some forty years ago, meeting Mr. Macpherson at the earl of Eglinton's, who prevailed on him to sing two or three airs that he had learned of his mother, who knew neither English nor music: but in the same manner as our villagers keep alive the babes in the wood, and Chevy Chase, by tradition, the song, in the Erse language, melodies to words of Ossian, which her son had translated and adapted to the measures and melodies of his mother's singing. The French, the Italians, and the Germans, having no doubts of the authenticity of the poems of Fingal and Ossian, were extremely struck with the bold wildness and original ideas of these poems, and when at Hamburgh, we mentioned, in the company of the Milton of Germany, Klopstock, the being in possession of the following melodies, which we wrote down for the first time perhaps that they were ever received on paper, he most earnestly intreated us to favour him with transcripts of these airs, which we readily promised to do: but, to our great regret, we were never able to find them till two or three months after his decease. We therefore now give them a place on our plates, not only as curiosities, but to appease the manes of the sublime Klopstock. For the airs, see *Plate Music XLV*.

OSSICULA AUDITUS, in *Anatomy*, the three small bones contained in the cavity of the tympanum. See EAR.

OSSICULA MUSCULORUM, in *Ichthyology*, a name given by authors to those oblong and slender bones which are situated in the flesh of some kinds of fish between the muscles: these, in the anterior part, and especially near the head, are of a forked shape; but in the hinder part of the body, they are usually simple and slender. These sorts of bones are found in the following kinds of fish: 1. In all the cyprini. 2. In the esoces. 3. In the clupeæ. 4. In the eels. 5. In the coregones. 6. In the osmerus. 7. In the salmon kind. 8. In mackrel. And 9. In the ammodytes or sand-eel. In the five last, these bones touch the spine at one end, but in the others they nowhere come near it.

The use of these loose bones seems to be, to strengthen and support the muscles, that by this means they may be able the more forcibly to move the body, and turn it about: they are peculiar to fish, no land animal having them.

OSSIFICATION, in *Anatomy*, the conversion into bone, as, for example, of a cartilage, in the natural process of formation of the skeleton; or of any other texture, in diseased changes of its nature. This process is described under BONE.

OSSIFRAGUM, in *Botany*, a name given by Bartholine, and some other writers, to a peculiar kind of grass, growing in some parts of Norway. It comes up early in the spring, before any other grass, and the cattle are tempted to eat it: but it emaciates them, and makes them sickly; their back bones become protuberant if they feed any time on it, and their legs so weak that they can hardly go. The remedy among the country people is a very bad one. They collect the bones of different animals, and break them into small pieces. The cattle greedily devour this sort of food when offered them in this disease, and there follows a sort of drivelling at the mouth for a considerable time, after which they become well. It is possible there may be much error in this story. The kingdom of Norway is full of mines, and the effluvia of these may be the occasion of the cattle's illness, and the ceasing of these effluvia their cure; for it is not probable that either of these effects should be owing to the grass or the bones.

OSSIG, in *Geography*, a town of Silesia, in the principality

pality of Neisse; three miles N.E. of Grotkau.—Also, a town of Saxony, in the bishopric of Naumburg; four miles S. of Zeitz.

OSSIPAGINA, in *Botany*, a name given by Arnobius and some other of the old Greek writers to the *consolida major*, or greater comfrey. It had this name from its supposed quality of agglutinating broken bones on being taken internally.

The Greek writers have sometimes called this plant *pete*.

OSSIPEE, OSSAPEE, or *Osfapy*, in *Geography*, a post-town, mountain, and pond, in Stratford county, New Hampshire, North America. The town was incorporated in 1785, and has 804 inhabitants. The lake lies N.E. of Winnepiscogee lake, between which and Ossapee lake is Ossapee mountain. Its waters run E. and are joined by South river, from Great Ossapee river, which discharges itself into Saco river, near the division line between York and Cumberland counties in Maine, and between Limerick and Gorham.

OSSNOBIAN. ASSENEBOYNE, *Indians*, a tribe found about the source of Ossnobia or Asseneboyne river, far W. of lake Superior. The Moravian missionaries report, that they live wholly upon animal food, or that they restrict themselves to the spontaneous productions of nature, denominating those who dig the ground "slaves." Bread is unknown to them; and they reject it from their mouths, calling it rotten wood. These Indians, as well as those numerous nations who inhabit the country from lake Superior towards the Shining mountains, are great admirers of the best hunting horses, with which the country abounds. The Ossnobians have no permanent place of abode, and live wholly in tents made of buffalo and other hides, with which they travel from one place to another, like the Arabs: and as soon as the food for their horses is expended, they remove, and pitch their tents in another fertile spot, and thus they emigrate, without scarcely ever returning to the same spots again.

OSSOLA, or OSCELLA, a district of Italy, between the Valais and lake Maggiore, about 35 miles in length and from 15 to 25 in breadth; the country is composed of mountains and vallies, but is fertile and populous. The capital is Domo d'Oscello.

OSSOLIN, a town of Poland, in the palatinate of Sandomirz; 20 miles W. of Sandomirz.

OSSOORAH, a town of Hindoostan, in Bengal; 16 miles N. of Bissunpour.

OSSORY, the name of a bishopric in Ireland, the cathedral of which is at Kilkenny. It includes almost the whole county of Kilkenny, a good part of the Queen's county, and some of the King's county, extending 46 English miles in length and 29 English in breadth, and containing 136 parishes. Such, however, are the unions, that there are only 56 benefices, and of these 20 were without churches when Dr. Beaufort published. There is also a barony called Ossory, which gave the title of earl to the eldest son of the dukes of Ormond.

OSSUN, a town of France, in the department of the Upper Pyrenées, and chief place of a canton, in the district of Tarbes; six miles S.S.W. of Tarbes. The place contains 1200, and the canton 10,558 inhabitants, on a territory of 160 kilometres, in 15 communes.

OSSUNA, an ancient and well-peopled town of Spain, in the province of Seville. It derives great advantage in case of a siege, from a fountain in the middle of it, which furnishes water to the inhabitants, whilst the whole country, for eight miles round, is totally destitute of that necessary article. When Cæsar besieged Ossuna, he was obliged to bring his provisions, and particularly water, from a great distance; 45 miles N.E. of Seville.

OST, in *Rural Economy*, a term applied to the kiln for drying hops. See KILN, and OOST.

OSTADE, ADRIAN VAN, in *Biography*, one of the very first class among the Flemish painters, was born at Lubeck in 1610, and was a disciple of Frank Hals, in company with Brouwer, with whom he contracted a close intimacy.

The choice of Ostade in the subjects he represented is somewhat similar to that of Teniers, but he treated them in a manner totally distinct, though not with so lively and spirited a touch, or so light and clear a management of his materials; yet with more care, more truth, and fullness of nature in the effects of colour and of chiaro-scuro, and with a great deal more meaning in the actions and expressions of his figures. These it must be confessed are generally of the lowest class, vulgar and gross in form, and in habits; and placed where usually such objects are to be found, in dirty hovels: yet among such animals little better than brutes, engaged in actions of gross gratification, such is the power of his pencil, so agreeable are the hues he employs, and the arrangement of light and shade in which they are disposed, that the most refined eye dwells upon his pictures with delight. He surprises our judgment into implicit admiration, by a truth of character, and energy of effect, which precludes the foundation of censure.

It is true his pictures are not always of such low subjects, but he never rises to any thing like gentility in character, and very seldom attempted it. His works are too highly laboured to be very numerous, and are, therefore, to be bought only at high prices. He was so much esteemed by contemporary artists, that many of the most eminent solicited him to put the figures in their landscapes, which by that means received an additional value. Ostade died in 1685, at the age of 75.

His younger brother, Isaac Van Ostade, was taught by him the art of painting, and imitated the style and taste of his instructor; but he died young, and never arrived at any degree of skill in the art comparable to that of his brother. As, however, he wrought in the same manner, and upon the same kind of subjects, some of his original productions, and many of his copies from Adrian, are palmed upon amateurs as the works of the elder Ostade. But the disparity is easily discernible by the judicious, the touch is not so free, the colouring not so transparent; nor have they an equal warmth or force of effect, in comparison with each other.

OSTALRIC, in *Geography*, a town of Spain, on the Tordera; 22 miles S.W. of Gerona.

OSTANO, a town of Italy, in the department of the Lario; 10 miles N. of Como.

OSTASCHKOV, a town of Russia, in the government of Tver, near the lake Seliger; 80 miles W. of Tver. N. lat. 56° 50'. E. long. 33° 34'.

OSTBY, a town of Sweden, in Angermanland; 60 miles N. of Hernösand.

OSTE, a river, which rises in the S. part of the duchy of Bremen, passes by Bremervorde, &c. and runs into the Elbe, at its mouth. N. lat. 53° 54'. E. long. 8° 54'.

OSTELLATO, a town of Italy, in the department of the Lower Po; 14 miles S.E. of Ferrara.

OSTEN, a town of Germany, in the duchy of Bremen; 11 miles N.W. of Stade.

OSTEND, a strong sea-port of France, in the department of the Lys, and chief place of a canton, in the district of Bruges. The town contains 10,800, and the canton 12,854 inhabitants, on a territory of 35 kilometres, in three communes. The harbour is good, and takes its name from its eastern situation. It is surrounded by a great number of forts,

forts, and ten bastions, and has four gates. This place, which at first was a small village, became a town in 1072; and was encompassed with walls in 1445 by Philip the Good, who erected gates, enlarged the town, and made the harbour more commodious. It was regularly fortified in 1583 by the prince of Orange. In the year 1601 it was besieged by the archduke Albert, and in September 1604, above three years after it had been first invested, the garrison and inhabitants, who had for this long interval, with equal skill and bravery, defended themselves against the most vigorous and determined assailants, and after a sacrifice of 100,000 brave soldiers, obtained the most honourable terms of capitulation. In the year 1706 it was besieged by some troops of the allied army, and after an obstinate resistance the garrison surrendered on capitulation. The States, having put in a garrison of their own troops, kept it till the year 1715, when, in consequence of the barrier treaty, they yielded it up to the troops of the emperors. In 1722 the court of Vienna established an East India company at Ostend; but in the year 1731 this company was dissolved. In 1745 Ostend was taken by the French, but restored to the empire at the peace of Aix-la-Chapelle. At the close of the year 1792 it was taken by the French, but evacuated in the following year. In 1711 the present town-house, which is a magnificent and handsome edifice, was begun and completed. The magistracy is composed of a bailiff, a burgo-master, seven echevins, and a treasurer; the office of bailiff is for life, and the other officers are annually changed. At Ostend they have no fresh water, which is brought in boats from Bruges, and preserved in a large reservoir near the harbour. The town was evacuated by the troops of the allies in July 1794. N. lat. $51^{\circ} 13'$. E. long. $11^{\circ} 52'$.—Also, a town of Africa, on the Ivory Coast; 30 miles N.E. of Cape Palmas.

OSTENSIO, a tax anciently paid by merchants, &c. for leave to show, or expose their goods to show and sale in markets.

OSTENSIVE DEMONSTRATIONS, such as plainly and directly demonstrate the truth of any proposition.

In which they stand distinguished from *apagogical* ones, or reductions *ad absurdum*, or *ad impossibile*, which prove the truth proposed, by demonstrating the absurdity or impossibility of the contrary.

Ostensive demonstrations are of two sorts: some barely, but directly, prove the thing to be; which they call *στι*. Others demonstrate the thing from its cause, nature, or essential properties; and these are called in the schools *διὰ*. See **DEMONSTRATION**.

OSTEOCOLLA, *οστεοκόλλα*, in *Natural History*, a white, or ash-coloured sparry substance, shaped like a bone, and by some supposed, without sufficient reason, to have the quality of uniting broken bones; on which account it is ordered in some plasters.

It is found in long, thick, and irregularly-cylindric pieces, which are usually hollow, but are sometimes filled up with a marly earth, and sometimes contain within them the remains of a stick, round which the osteocolla had been formed; but though it is plain from thence, that many pieces of osteocolla have been formed by incrustations round sticks, yet the greater number are not so; but are irregularly tubular, and seem formed of a flat cake, rolled up in a cylindric shape. The crusts of which these are composed do not form regular concentric circles round the internal cavity, as must have been the case had they been formed by incrustation, but shewing plainly that they were once so many thin strata, composing a flat surface, which has afterwards been rolled up as one might do a paper three or four times doubled,

into two, three, or more spiral lines; in which case, each single edge of the paper would be every where a regular part of a continued spiral line drawn from a given point; but they would by no means be so many detached concentric circles.

The osteocolla is found of various sizes, from that of a crow-quill to the thickness of a man's arm. It is composed of sand and earth, which may be separated by washing the powdered osteocolla with water, and is found, both in digging and in several brooks, in many parts of Germany, and elsewhere.

Osteocolla is called *hammoſteus* in many parts of Germany. It has this name in these places from the observation of its always growing in sand, never in clay, or any solid soil, nor even in gravel. Where a piece of it any where appears on the surface, they dig down for it, and find the branches run ten or twelve feet deep. They usually run straight down, but sometimes they are found spreading into many parts near the surface, as if it were a subterraneous tree, whose main stem began at twelve feet depth, and thence grew up in a branched manner, till met by the open air. The main trunk is usually of the thickness of a man's leg, and the branches that grow out from it are thickest near the trunk, and thinner as they separate from it. The thinnest are about the size of a man's finger. The people employed to collect this osteocolla, when they cannot find any mark of it on the surface, search after the specks of white or little lumps of whitish soft matter, which they find lying in different parts on the top of the sand. These always lead them either to a bed of perfect osteocolla, or to some in the formation. If they miss of the substance which they seek after, they still find the substance like rotten wood; which, when traced in its course, is found to proceed from a main trunk, at the depth of that of the osteocolla, and to spread itself into branches in the same manner. The diggers call this substance the flower of osteocolla, or *hammoſteus*.

The osteocolla found in the earth is at first soft and ductile, but in half an hour's time, if exposed to the air, it becomes as hard as we find it in the shops. The method to take up a perfect piece for a specimen is to open the ground, clear away the sand, and leave it so for an hour or thereabouts: in this time it will harden, and may be taken out whole. It is certain that the osteocolla is produced at this time; for, if a pit be cleared of it, there will more grow there in a year or two, but with this difference, that it will be softer and will not harden so easily in the air as the other. What the rotten substance resembling the decayed branches of trees is, it is not easy to say, unless it really be such: but the opinion of the common people, that it is the root of something, is absurd; because its thickest part always lies at the greatest depth, and the branches all run upwards. The osteocolla is a marly spar, which concretes round this matter; but what it is that determines it to concrete no where on the same ground but about these branches it is not easy to say. The rottenness of this substance, which forms the basis of the osteocolla, renders it very liable to moulder and fall away; and hence it is that we usually see the osteocolla hollow. Sometimes it is found solid, but in this case there will be found to have been a vegetable matter serving as its basis, and instead of one branch, it will be found in this case to have concreted about a number of fibres, the remains of which will be found in it on a close examination. Phil. Trans. N^o 39.

OSTEOCOLLA-Flower. See **FLOWER**.

OSTEOCOLLA-Root. See **ROOT**.

OSTEOCOLLON, in *Botany*, a name given by some authors to the great comfrey.

This

This name was given by some of the old writers to the symphytum, or comfrey, from an opinion that its agglutinating quality reached to the bone, and that it was of great service taken internally, in cases of fractures.

OSTEOCOPOS, or OSTOCOPOS, formed from *ὀστέον*, bone, and *κοπήναι*, to break, cut, or cleave, is used by some for an acute pain, in which the patient is affected as if his bones were breaking.

It rises from a sharp humour vellicating the periosteum, or membrane, with which the bones are invested. It is particularly incident to scorbutic and pocky persons.

OSTEOGENIA is a technical term applied to the formation of the bones.

OSTEOGONY. See OSSIFICATION.

OSTEOGRAPHIA is a description of the bones; a title which has been given to some anatomical works.

OSTEOLOGY is that division of *Anatomy* which treats of the bones. The organisation of the bones, and the progress of their formation, have been considered under the articles BONE in *Anatomy*, BONE in *Chemistry* and the *Arts*, and EMBRYO. The particular bones are described in various articles of this work: those of the head in CRANIUM; of the vertebral column in SPINE; of the chest in LUNGS; and of the limbs in EXTREMITIES. A description of the marrow will be found under MEDULLARY System; and for the articulations by which the bones are connected, see JOINT.

OSTEOSARCOMA, or OSTEOSARCOSIS, in *Surgery*, a swelling, the consistence of which is partly bone and partly flesh. Also the disease called *mollities ossium*.

OSTEOSPERMUM, in *Botany*, is named in allusion to its hard, bony seeds, and derived from *ὀστέον*, bony, and *σπέρμα*, seed. Linn. Gen. 448. Schreb. 585. Willd. Sp. Pl. v. 3. 2365. Mart. Mill. Dict. v. 3. Ait. Hort. Kew. ed. 1. v. 3. 275. Juss. Gen. 183. Lamarck Dict. v. 4. 659. Illustr. t. 714. Gærtner. t. 168. (Monilifera; Vaill. Mem. Par. 1720. f. 28. Chrysanthemoides; Tournef. Mem. Par. 1705. f. 4. Dill. Gen. 9. Elth. 68.)—Class and order, *Syngenesia Polygamia Necessaria*. Nat. Ord. *Compositæ Discoideæ*, Linn. *Corymbifera*, Juss.

Gen. Ch. Common calyx simple, hemispherical, of numerous, awl-shaped, minute leaves. Cor. compound, radiated; florets of the disk perfect, numerous, tubular, five-toothed, the length of the calyx; those of the radius female, about ten in number, ligulate, linear, three-toothed, very long. Stam. (in the perfect florets) Filaments five, capillary, very short; anthers united into a cylindrical tube. Pist. (in the perfect florets) Germen very small; style thread-shaped, scarcely as long as the stamens; stigma emarginate; the female or ligulate florets differ in having their germen globose and a somewhat longer style. Peric. none, except the unchanged calyx. Seeds (in the perfect florets) none: (in the female ones) solitary, nearly globose, coloured, indurated by age, and inclosing a kernel of the same shape. Down none. Recept. naked, flat.

Eff. Ch. Receptacle naked. Down none. Calyx of many leaves. Seeds globular, coloured, bony.

Obf. Of this extensive and rather showy genus we find only twelve species described in the *Species Plantarum*. In the 14th edition of *Syst. Veg.* fifteen are enumerated, and to these Professor Martyn has added two more. Willdenow however has extended the genus to twenty-three species, from which we select the following for illustration.

O. spinosum. Prickly Osteospermum. Linn. Sp. Pl. 1308. Jacq. Hort. Schoenbr. v. 3. 66. t. 377.—Leaves obovate, serrated, downy. Permanent flower-stalks spinous.—Native of the Cape of Good Hope, flowering in September

and October. Stem round, branched, erect, from two to six feet high, shrubby, denudated and scarred when old. Branches woolly when young, rather rigid, terminating in spinous, branched stalks, each bearing one flower. Leaves scattered, on stalks, attenuated at their base, obtusely pointed, thickish, slightly webbed with down, glaucous. Flowers star-like, solitary, yellow, having a sweet smell.

O. piffiferum. Smooth Osteospermum. Linn. Sp. Pl. 1308. (*O. fruticans*, lanuginosum, foliis oblongis dentatis; Burmann. Afric. 171. t. 61. f. 2.)—Leaves ovato-lanceolate, pointed, slightly stalked, smooth, serrated.—This native of the Cape was cultivated in 1757, by Mr. Philip Miller. Stem four or five feet in height, much branched upwards, in a spreading manner. Bark purplish. Leaves thick and succulent, alternate, light green. Flowers solitary, yellow, on long, axillary stalks. Seeds oval, at first green, then red, and afterwards dark purple.

O. moniliferum. Poplar-leaved Osteospermum. Linn. Sp. Pl. 1308. (*Chrysanthemoides africanum*, populi albæ foliis; Tournef. Dill. Elth. v. 1. 80. t. 68. f. 79.)—Leaves obovate, serrated, stalked, somewhat decurrent.—Native of the Cape. It was introduced into this country in 1714, though it flowers but rarely. Stem shrubby, seven or eight feet in height, much branched, and covered with a smooth grey bark. Leaves alternate, very thick and fleshy, covered with a hoary down; their stalks, according to Linnæus, have a knob under their base. Flowers clustered, at the ends of the branches, yellow, resembling those of *Senecio Jacobæa*.

O. ilicifolium. Holly-leaved Osteospermum. Willd. n. 5. (*O. foliis scabris, sinuosis, denticulatis*; Burmann. Afric. 172. t. 62.)—Leaves oblong, with angular teeth, rough, half embracing the stem. Branches furrowed.—Native of the Cape of Good Hope. Stem shrubby, branched, about two feet high, rather lax. Leaves shaped much like those of our Common Holly, sessile, involute at the margin, rough on the upper side, villose and almost woolly beneath. Flowers terminal, stalked, yellow.

O. cæruleum. Blue-flowered Osteospermum. Willd. n. 7. Jacq. Ic. Rar. v. 1. t. 179. (*O. pinnatifidum*; L'Herit. Stirp. Nov. 11. t. 6.)—Leaves pinnate; segments toothed.—Native of the Cape. It flowers with us from June to September. This shrub is about three feet in height, with a strong smell. Root woody, branching, fibrous. Stem woody, erect, round, regularly branched, grey. Leaves pinnate, alternate, spreading; segments oblong, acute, serrated; stalks half the length of the leaves, scarcely downy. Flowers terminal, in a loose corymb, stalked, erect, blue. Seeds somewhat angular and rugged, but, according to L'Heritier, not at all bony.

The remaining species of *Osteospermum* which occur in Willdenow, and which do not appear to be anywhere figured, are as follows. *O. spinescens*, rigidum, bipinnatum, arctoides, perfoliatum, niveum, herbaceum, hirsutum, Bidens, ciliatum, junceum, corymbosum, scabrum, incanum, triquetrum, teretifolium, imbricatum, and polygaloides. They are all natives of the Cape of Good Hope, and all, except rigidum, are taken from Thunberg's Prodromus.

OSTEOSPERMUM, in *Gardening*, comprises plants of the shrubby exotic kind for the greenhouse, of which the species cultivated are; the prickly osteospermum (*O. spinosum*); the smooth osteospermum (*O. piffiferum*); the poplar-leaved osteospermum (*O. moniliferum*); and the blue-flowered osteospermum (*O. cæruleum*).

Method of Culture.—These plants may be increased by cuttings of the young shoots, which may be planted in any of the summer months, upon a bed of light earth, being watered

watered and shaded until they have taken root, when they must be taken up and planted out separately in pots; as when they are suffered to stand long, they are apt to make strong vigorous shoots, and be difficult to transplant afterward, especially the second and third sorts; but there is not so much danger of the first, which is not so vigorous, nor so easy in taking root as the other. In the summer season the pots should be frequently removed, to prevent the plants from rooting through the holes in the bottoms of the pots into the ground, which they are very apt to do when they continue long undisturbed, and when they shoot very luxuriantly; and on their being removed, these shoots, and sometimes the whole plants, are destroyed.

As the plants are too tender to live in the open air in this climate, they should be placed in the greenhouse in October, and be treated in the same manner as myrtles, and other hardy greenhouse plants, which require a large share of air in mild weather; and in the beginning of May the plants removed into the open air, and placed in a sheltered situation during the summer season. As the first and second sorts are very thirsty plants, they should have plenty of water.

These plants afford variety among others of the greenhouse kind.

OS'IER, in *Geography*, a town of Russia, in the government of Kiev, at the conflux of the rivers Oster and Desna; 24 miles N. of Kiev. N. lat. 50° 58'. E. long. 31° 14'.

OSTER Cappeln, a town of Westphalia, in the bishopric of Osnabruck; 10 miles E.N.E. of Vorden.

OSTER Oen, an island near the coast of Norway; 20 miles N.W. of Bergen.

OSTERBURG, a town of Westphalia, in the Old Mark; 36 miles N.W. of Brandenburg. N. lat. 52° 48'. E. long. 11° 56'.

OSTERBY, a town of Sweden, in the province of Upland, remarkable for its furnaces, and near the iron-mine of Dannemora, which is one of the largest and richest in Sweden; 24 miles N. of Upsal. See DANNEMORA.

OSTERFELS, a town of Saxony, in the bishopric of Naumburg; 7 miles S.E. of Naumburg. N. lat. 51° 5'. E. long. 11° 53'.

OSTERHOFEN, a town of Bavaria, on the Danube, 20 miles N.W. of Passau.

OSTERHOLZ, a town of the duchy of Bremen, the inhabitants of which are employed in digging peat or turf, which they sell, to the annual amount of 18,000 rix-dollars, to the people of Bremen; 7 miles E. of Bremen.

OSTERLOF, a town of Sweden, in the province of Schonen; 8 miles N. of Christianstad.

OSTERMAN, Count, in *Biography*, a celebrated Russian minister, was the son of a clergyman at Bockhum in Westphalia. Being, in his youth, taken into the service of the Russian admiral Cruys during his residence in Holland, he accompanied that officer in 1704 as his private secretary. In the course of a few years, he was presented by the admiral to Peter the Great, as every way qualified to write his dispatches; his first essay so well pleased his sovereign, that he immediately made him his secretary, and in this situation he soon gained the confidence of his employer. He thus rose, step by step, to the most important offices in the government, and the emperor was so much his friend, that he brought about a marriage between him and a lady connected with some of the noblest families in Russia. He preserved his influence in Russia during the reigns of several sovereigns; but in the revolutions that placed the empress Elizabeth on the throne, he became involved in the same disgrace as counts Munich and Lowenwolde. He was even condemned to suffer death, but his punishment was com-

muted for perpetual banishment in the desolate regions of Siberia, where he died in the year 1747, in the same place where Mentizoff had ended his days some years before. After his death his wife and family were recalled, and their property and rank restored to them. Count Osterman possessed a sound judgment, and was capable of the most indefatigable labour; no minister of the same period was so well acquainted with the interests of the different courts of Europe, and in the exercise of his official duties none could be more disinterested and incorruptible; but he was suspicious and overbearing, and he expected all his coadjutors to give way to whatever he proposed. This, however, is very generally the case with great minds. "His mode of expressing himself," says his biographer, "was so artful and obscure, that few could flatter themselves that they were able to discover his true meaning. His style also, in general, was so ambiguous, that whatever he wrote might be explained two different ways. Though he was completely master of his feelings, and would appear to participate in things which were contrary to his conviction, he was so much afraid of betraying his real sentiments by external emotions, that he never looked those full in the face with whom he conversed." Gen. Biog.

OSTERMARK, in *Geography*, a town of Sweden, in East Bothnia; 18 miles N.E. of Christianstad.

OSTERO, a small island on the E. side of the gulf of Bothnia. N. lat. 63° 23'. E. long. 21° 39'.

OSTEROD, a town of Norway; 28 miles N.N.W. of Drontheim.

OSTERODE, a town of Westphalia, in the principality of Grubenhagen, on the Saal, containing about 800 houses, and a magazine of corn, which is delivered out to the miners of Harz forest always at a fixed price. The town has also a manufacture of woollen stuffs; 16 miles W. of Goslar. N. lat. 51° 44'. E. long. 10° 6'.

OSTEROE, one of the Faroe islands, E. of Stromoe, and separated from it by a narrow channel. N. lat. 61° 50'.

OSTERRODE, a town of Prussia, in the province of Oberland, on the river Dribentz, defended by a castle; 45 miles S.E. of Dantzic. N. lat. 53° 36'. E. long. 19° 52'.

OSTERSUND, a town of Sweden, and capital of Jamtland, on the E. side of the lake Storpio; 95 miles W.N.W. of Hernosand. N. lat. 63° 10'. E. long. 14° 27'.

OSTERSUNDAM, a town of Sweden, in the province of Nyland; 9 miles N.E. of Helsingfors.

OSTERTZ, a town of Croatia; 14 miles S.W. of Varasdin.

OSTERWALD, JOHN FREDERIC, in *Biography*, was born at Neufchatel in the year 1663. He commenced his academical studies at Saumur, and so rapid was the progress which he made in them, that he was admitted to the degree of M. A. before he was sixteen years of age. He afterwards pursued his studies at Orleans and Paris, and was admitted to the office of the ministry. He settled as pastor to the church of his native place in 1699, and contracted an intimate friendship with the celebrated John Alphonfus Turretin of Geneva, and Samuel Werenfels of Basil, and the union of these three theologians, which was called the *triumvirate of Swiss divines*, lasted till their deaths. Osterwald died in 1747, at the age of 84. He was author of several useful works written in the French language, of which the principal are; 1. A Catechism of the Christian Religion; 2. Arguments and Reflections on the Books of the Bible; 3. Treatises on Uncleaness, and on the Sources of Corruption; and 4. A Collection of Sermons. His son, John Rodolph Osterwald, was pastor of the French church at Basil. Moreri.

OSTERWICK, in *Geography*, a town of Pomerelia; 10 miles S.S.E. of Dantzic.—Also, a town of Westphalia, in the principality of Halberstadt, seated on the Ille, containing several woollen manufactures; 15 miles N.E. of Goslar. N. lat. $51^{\circ} 59'$. E. long. $10^{\circ} 33'$.

OSTHAMMAR, a sea-port of Sweden, in the province of Upland, formerly a staple-town, situated on a small rocky island, called "Gold Sheor," in the Aland's Haff, near the coast; 30 miles N.E. of Upsal. N. lat. $60^{\circ} 15'$. E. long. $18^{\circ} 19'$.

OSTHEIM, a town of Germany, in the county of Henneberg; 8 miles S.W. of Meinungen.

OSTIA, in *Anatomy*, a term used indifferently with oscula, orifices, &c. for the mouths or apertures of the body; as the *ostia vagina*, &c.

OSTIA, or *Osti*, in *Geography*, a sea-port town of Italy, and the see of a bishop, situated 13 miles from Rome, at the mouth of the Tiber, whence it derived its name. This port was first constructed and the town surrounded by walls, in the time of Ancus Martius. The harbour was reckoned one of the most magnificent and stupendous of the Roman works; but it was ruined by the accumulation of sand, and by the change of the course of the river, which ran into the sea by another arm. In the 16th century, when the remains of this Augustan port were still visible, the antiquarians sketched the plan (see d'Anville, *Mem de l'Acad. des Inscriptions*, tom. xxx. p. 198.) and declared, with enthusiasm, that all the monarchs of Europe would be unable to execute so great a work. Ostia Tiberina, the two mouths of the Tiber, were separated by Holy Island, of an equilateral form, each of whose sides was estimated at two miles. In the time of Strabo, the harbour was so choked, that the island was augmented, and the town and port were left at a considerable distance from the shore.

In the third or fourth century, Ostia was erected into a bishopric; the old town was destroyed by the Saracens; and the new one consists only of a cathedral, and of a few mean houses built round it. The air here is very indifferent. N. lat. $41^{\circ} 46'$. E. long. $12^{\circ} 13'$.

OSTIAKS, a denomination comprehending three tribes of people, connected with the Finns and the Samoyedes. In the conquest of Siberia, by the Tartars, they contemptuously called all the inhabitants of this extensive country, whilst they knew only a small part of it, "Uſchtyæk," a word denoting a foreigner or barbarian. This denomination was at first retained by the Russians from ignorance, and has been since lost in proportion as the diversity of the Siberian nations has been detected. At present there remain three very distinct people, both in descent and language; viz. the Ostiaks of the Oby, of the Marym, or Narym, and of the Yenissey; the first of these tribes belongs to the stock of Finns. The Ostiaks of the Southern Oby call themselves Asyaks, from the river Oby, which in their language is called Yak; the northern, Khondi Khui, people of Konda, because they withdrew from that river towards the north. Both stems dwell at present about the Oby and the Irtysh, in the government of Tobolsk, and derive their origin from the Perimians, from whom they probably separated to avoid bishop Stephen's barbarous zeal for making converts. If this derivation were as certain as it is probable, from the similitude of the languages, they must surely have had some very urgent motive for quitting their mild and gentle sky on the W. side of the Ural, for the inclement regions of the Oby. The Ostiaks of the Oby are held to be one of the most numerous of the Siberian nations; but accurate statements of the amount of their population are wanting.

The Narym Ostiaks, who are also called Morases, are

about the upper parts of the Surgut, in the districts of the Oby quite to the Narym, and about the mouths of the rivers Ket and Tom.

The Yenissey Ostiaks, though they resemble the two other nations of that name in appellation and mode of life, yet speak a language so entirely different from that of the Ostiaks, as well as from all the Siberian tongues, that they might rather be taken for races of a particular nation, though not the smallest indications of their origin have been hitherto discovered. These dwell about the inferior Yenissey, near and between the Samoyedes. When the Russians, in the 17th century, had extended their conquest hither, these Ostiaks not only immediately submitted, but also assisted the Russians to subdue the neighbouring nations. In proportion to the dimensions of the ground they occupy, they are not numerous. Tooke's *Russ.* vol. i.

OSTIANO, a town of Italy, in the department of the Upper Po; 12 miles N.E. of Cremona.

OSTIANY, a town of Lithuania, in the palatinate of Wilna; 40 miles S.E. of Wilna.

OSTIARY, one of the five inferior orders in the Roman church, whose office is to keep the doors of the church, and to toll the bell.

OSTICO, in *Geography*, a small lake of America, in Onondago county, New York, which sends its waters from the N. end by a stream 16 miles long to Salt lake.

OSTIGLIA, a town of Italy, in the department of the Mincio; 10 miles E.S.E. of Mantua.

OSTIMURI, a town of New Mexico, in the province of Hiaqui; 40 miles E. of Riochico. N. lat. $29^{\circ} 12'$. W. long. $110^{\circ} 56'$.

OSTINATO, Ital., in *Music*, obstinate, persevering in a theme or subject, without variety.

OSTINES, or **CHARLESTOWN**, in *Geography*, a considerable town in the island of Barbadoes.

OSTINGHAUSEN, a town of Germany, and seat of a prefecture, in the duchy of Westphalia; 8 miles W. of Lippstadt.

OSTIONES, a small island in the Pacific ocean, near the coast of America. N. lat. $4^{\circ} 10'$.

OSTRACH, a river of Germany, which runs into the Danube, about a mile below Scheer.

OSTRACION, or *Trunk-fish*, in *Ichthyology*, a genus of fishes of the order Branchiostegous, of which the generic character is; teeth round, pointing forwards, blunt; aperture of the gills linear; body mailed by a complete bony covering. It has no ventral fins. There are twelve species, which are as follow:

Species.

TRIQUETER. The specific character of this is, that it is triangular-bodied, and unarmed. It is about twelve inches in length, and is, as its name imports, of a trigonal shape, the sides sloping obliquely from the ridge of the back, and the abdomen being flat: the whole animal, except to witin a small distance from the tail, is completely enveloped in a bony covering, divided into hexagonal spaces, and covered, as is the case in the whole genus, with a transparent epidermis, like that of the armadillo among quadrupeds: the usual colour is a subferruginous brown, with a white spot in the centre of each hexagon, which is also marked by fine rays diverging from the centre to the edges. It is a native of the Indian and American seas, and is supposed to feed on smaller crustacea, shell-fish, and sea-worms. It is considered as an excellent fish for the table, and is held in high estimation among the inhabitants of India.

TRIGONUS. Triangular; two subcaudal spines; the dorsal

sal fin is fourteen-rayed. It inhabits India. It is said to make a kind of grunting noise when first taken, owing to the sudden explosion of air from its branchial orifices.

BIACULEATUS. This is the triangular-bodied trunk-fish, with two subcaudal spines, and ten rays in the dorsal fin. There is a variety, the body of which is covered with spots and tubercles. They are found in India, and are thought by some naturalists to be varieties of the *O. trigonus*.

TRICORNUS. Triangular, with two frontal spines and one dorsal. It is about ten inches long; in the front of the head there are two short pointed spines, directed forwards; above the naked part of the body, near the tail, is a long upright pointed spine: the shield is divided into hexagons, each obscurely marked into triangular spaces. It is a native of India.

QUADRICORNUS. Triangular, with two frontal and subcaudal spines. It inhabits India and Guinea.

TURRITUS. This is nearly quadrangular; the eye-brows and back with a single spine; the belly with four on each side. It inhabits the Red sea, and is four inches long; the body tuberculate, yellowish-ash, brown on the naked parts; the bony coat is divided into hexagonal pieces, that are rough with numerous elevated dots, the futures pellucid; the shell of the belly very broad, flat, oval, tapering on the fore-part, and obtuse behind; the back is convex, marginate at the sides; the middle is gibbous, compressed, triangular, with an erect short spine, turned back; the front is perpendicular, rounded, convex, depressed beneath the eyes; the iris is golden.

CORNUTUS. Quadrangular-bodied trunk fish, with two frontal and two subcaudal spines. The length of this fish is about eight or ten inches; the shape is squarish; broad and abrupt towards the head, and tapering considerably towards the hind part; the back is nearly straight; the cruit or mail is strongly marked into large hexagons; from the top of the head project two strong, lengthened, sharp spines, pointing straight forwards; and on each side the anal fin is a similar spine pointing directly backwards; the tail is long, large, and of an oval shape; the colour of the whole animal is yellowish-brown, and deeper beneath; the tip of the tail is dusky. It is a native of the Indian and American seas.

AURITUS. Brown; one spine over each eye; two on each side the back, and two on each side the belly. It inhabits near the islands of the Pacific ocean, was observed during the voyages of captain Cook, and a specimen is preserved in the British Museum.

TUBERCULATUS. Quadrangular, unarmed, with four dorsal tubercles. It inhabits India.

GIBBOSUS. Quadrangular, unarmed, gibbous. It inhabits Africa, and is thought to be a variety of *O. triquetus* above described.

CUBICUS. Quadrangular, unarmed; sides flattish. It resembles the *O. triquetus*, but has a square body. The mail is marked into tuberculated hexagons, each of which has a white or blueish central spot, surrounded with a darker border: the ground colour of the whole mailed part is a pale yellowish-brown; of the naked or projecting part towards the tail yellowish-brown, with a few dusky variegations; the tail and fins are of a reddish-brown. It is a native of the Indian seas, and is said to be an excellent fish for the table, and to be kept for that purpose in reservoirs, growing so familiar as to come at a given signal to the surface of the water, and take its food from the hand.

MELEAGRIS. This is somewhat square; blackish, speckled with white. It inhabits the Southern ocean; is from six to eight inches long, and beautifully marked with almost innumerable white spots. It is a native of the In-

dian seas, and was often observed during captain Cook's voyages about the coasts of New Holland, Otaheite, &c.

These are the species enumerated in Gmelin's edition of Linnæus; we shall now mention three others described in Dr. Shaw's Zoology.

CONCATENATUS; Triangular-bodied unarmed trunk-fish, with whitish concatenated variegations. The habit of this species is very like to that of the trigonal and triangular trunk-fish, but with a less elevated back; the mail is marked into triangular, ovate, and other shaped spaces, in a kind of reticular pattern; the colour is brown, the lines dividing the spaces being of a pale rose-colour; the fore-parts and abdomen of the same colour; the end of the body is brown; tail and fins pale brown. It is a native of the American seas.

NASUS; Whitish subquadrangular-bodied trunk-fish, with brown concatenated variegations. The habit of this is approaching to that of the preceding species, but more slender; the head is very convex; the colour is greenish-white, or ash, with the mail marked into very large hexagons, by means of broad, ovate-lanceolate, blackish lines, with similar ones radiating from the centre of the hexagons, and thus elegantly dividing the whole into triangles, with finer lines or margins accompanying each; the naked or projecting part of the body, towards the tail, is marked with round black spots; the fins and tail are of a reddish-brown. It is a native of the Indian and American seas.

STRIATUS. Trunk-fish with yellow and blue stripes, and a spine over each eye, two on each side the back and abdomen, and one on each side the body. This in size and habit is very like the *O. auritus*; the colour is a beautiful variation of bright blue and yellow, in the form of lines disposed in different directions, but principally in a longitudinal one over the whole fish; above each eye is a strong spine, as in the *auritus*. On the ridge of the back are two pair, disposed as in that species; and on each side the abdomen there are three, the middle of which is higher than the rest. It is doubted whether this fish be a mere sexual difference of the preceding; or, it is thought the *auritus* may be in reality no other than the present animal changed in colour, from the circumstance of its having been long preserved in spirits of wine. It was observed by Capt. G. Tobin, about the coasts of Adventure bay, in Van Diemen's land.

OSTRACISM, *ostracismus*, a kind of popular judgment or condemnation among the Athenians; being a sentence of banishment against persons, whose too great power rendered them suspected to the people; or whose merit and credit gave umbrage lest they should attempt something against the public liberty, and their power degenerate into tyranny.

It had the denomination ostracism, because the people gave their votes, by writing the name of the person to be banished in a shell, by the Greeks called *ostrakon*, and casting the shells into an urn.

This kind of banishment had nothing infamous in it, as not being for a crime; but, on the contrary, was held very honourable, as it was a mark of popularity.

It lasted for ten years; but the banished person had the full enjoyment of his estate all the time.

Ostracism was null, unless there were 6000 citizens in the assembly of the people, whereby it was decreed.

OSTRACITES, in *Natural History*, a name given by authors to the fossil oysters, common in many parts of England. These are of various shapes and kinds; and the name is by some authors made to signify the shell itself, when preserved in its native state and condition; as is the case with those found about Woolwich and Blackheath; and by others,

others, the stones cast or formed in those shells, or in cavities from whence they have been washed away and dissolved: in both these cases the stone carries the exact resemblance of the shell, even in its nicest lineaments; in the first case, bearing every mark of the inside, in the other of the outer surface. We have this stone in great plenty in many parts of England; and it is very famous, in some places, for its virtues in cases of the gravel, and the like complaints.

It is to be observed that all the fossil shells, and particularly the *lapides Judaici*, or Jew's stones, which have been the spines of sea echini, have been esteemed diuretics, and good in the stone and gravel. Among the ancients, Dioscorides, Pliny, and all the rest, recommend them highly.

Dr. Home, in the *Philos. Transf.* says, the ostracites rather dissolves the little stones than forces them out, as not being remarkably diuretic. He adds, that he prescribes it in powder, with a third part of *flores chainæmeli*. The dose is from half a drachm to a whole one, in white wine.

OSTRACITES is also the name of a kind of cadmia, found at the bottom of furnaces where copper is purified. It is very heavy, and in structure resembles an oyster-shell; whence its name.

It has been esteemed astringent and detensive; and introduced as an ingredient in several unguents.

OSTRACODERMATA, a term used by Aristotle to express that class of shells which we call *testaceous*, in opposition to the crustaceous animals, or *malacostraca*.—The definition Aristotle gives of this class of animals is, that they are soft within, but hard without; that their shells may be bruised or broken, but their parts cannot be torn from one another, as they can in the crustaceous kind, such as the lobster; whose shell covering the legs, body, tail, &c. being so many distinct pieces of shell, and only joined by membranes, may be torn asunder by pulling till those membranes give way. *Philos. Transf.* N° 219. p. 199.

OSTRAU, or OSTROW *Mabrisch*, in *Geography*, a town of Moravia, in the circle of Prerau, on a river of the same name, on the borders of Silesia; 20 miles S.E. of Troppau. N. lat. 49° 47'. E. long. 18° 17'.

OSTRAU, a town of Moravia, in the circle of Hradisch, on an island in the river Marsch; 7 miles S. of Hradisch.

OSTRAVA, or OSTRAWIEC, a river which separates the principality of Teschen from Moravia, and runs into the Oder, 5 miles S. of Oderburg.

OSTREA, the Oyster, in *Natural History*, a genus of the class and order Vermes Testacea. Animal a tethys; shell bivalve, generally with unequal valves, and slightly eared; hinge without teeth, but furnished with an ovate hollow, and mostly lateral transverse grooves. Of this genus there are one hundred and thirty-six species, divided into two sections, which sections are likewise subdivided. Most of the species of this genus are furnished at the hinge internally with numerous parallel internal grooves in each valve, and they are distinguished from the genus *Arca*, in not having teeth alternately locking in each other.

Section A. The species in this section have valves furnished with ears and radiate; denominated Scallop. These leap out of the water to the distance of half a yard, and opening the shells, eject the water within them; after which they sink under water, and suddenly close the shells with a loud snap. This section is subdivided into three subsections, viz. (a) equilateral; ears of the valves equal, containing forty species: (b) ears unequal, one of them generally ciliate with spines within, containing fifty-four species: and (c) valves more gibbous on one side; in this subsection there are seven species.

a. Equilateral; ears of the valves equal.

Species.

* MAXIMA. Shell with fourteen rounded longitudinally striate rays. This is delineated by Mr. Donovan in his *British Shells*. There are two other varieties described by Lister and Knorr. These are found in most European seas, in large beds; whence they are dredged up, and pickled and barrelled for sale. This is the shell that was formerly worn by pilgrims on the hat or coat, as a mark that they had crossed the sea, for the purpose of paying their devotions in the Holy Land, in commemoration of which it is still preserved in the arms of many families. The shell is five or six inches long, and rather broader; the ears are large, with decussate striæ; the hinge with a large deep hollow; lower valve convex, white, often varied with red bands or spots; the upper valve is flat and reddish.

* JACOBÆA. Shell with about fourteen angular and longitudinally striate rays. It inhabits European seas, and is less than the last. The grooves of the shell are transversely striate; the upper valve is flat; the lower valve with angular rays; the ears are concave and smooth on the upper side.

ZICZAC. Shell with flattened rays. It inhabits the American ocean; sometimes of one colour, sometimes variegated; the ears are very finely wrinkled; the lower valve is convex, with from eighteen to twenty rays, which are very finely striate transversely, and about twice the number of perpendicular striæ within. The upper valve is flat.

STRIATULA. Shell with sixteen faint rays with transverse membranaceous striæ; the margin very entire. It is found in the Indian ocean. The shell is middle-sized, varied with purple and white, within yellowish.

MINUTA. Shell with twenty convex rays. It inhabits the Indian ocean. The shell is about the size of a nut; lower valve white and very convex; upper valve white clouded with brown, flatter and plaited.

PLEURONECTES. Shell equivalve, with twelve doubled rays, and smooth on the outside. It inhabits the Indian ocean; it is sometimes reddish, or of a flesh-colour, or liver-colour; within it is silvery. There is a variety of an orange-colour radiate with red; it is four inches and a half long, and gaping at each end.

LAURENTH. Upper valve sub-convex, smooth, with fine perpendicular lines crossing very fine concentric transverse striæ; lower valve with twenty-four rays and forty-eight striæ within. It is found on the shores of South America, and is very rare. The shell is nearly three inches long, and about as broad.

JAPONICA. Shell equivalve, a little convex, margined with yellow; upper valve with faint lines crossing concentric transverse bands, and forty elevated striæ within. It is found on the shores of Guinea and Japan; is about five inches and a half long and broad, and resembles the *O. pleuronectes*, but is coarser and thicker.

MAGELLANICA. The shell of this is likewise equivalve, glabrous, with oblong crowded striæ. It is found in the straits of Magellan; it resembles the *O. pleuronectes*. The shell is lateritious, not radiate, quite smooth within; upper valve more convex; lower valve flatter than in most others, the ears are transversely striate.

HYBRIDA. Shell with nine or ten rays, the interstices longitudinally striate; margin repand within. It inhabits the Norway seas; thin, lower valve white, upper valve sanguineous, with angular veins and lines.

RADULA. Shell nearly equivalve, with twelve convex rays crossed by crenate striæ. It is found in the Indian ocean;

OSTREA.

ocean; is three inches and a quarter long, and two and a half broad. The shell is oblong, white, or varied with white and brown; the lower valve is a little more convex; ears wrinkled and furrowed with oblique striæ.

IMBRICATA. Shell nearly equivalve, with nine unequal rays imbricate with scales. It is found on the shores of the Red sea, and resembles the last. The colour of the shell is whitish with purple spots, and a little crenate at the margin; the rays alternately larger.

SUBROTUNDA. Shell roundish, with eight convex chefnut rays; ears roundish, white with a yellowish border. The shell is one inch and a half long and two inches broad.

PLICA. Shell nearly equivalve, with six convex smoothish rays, and striate acrofs. It inhabits India, is about one inch and a quarter long and an inch broad. The shell is white, or white spotted with brown, or red spotted with white; the transverse striæ are placed at a distance from each other.

CRENATA. Shell roundish with convex rays, the outer ones finely striate longitudinally; margin deeply crenate. The ears are transversely striate.

* **SINUOSA.** Shell ovate with very numerous and fine striæ; the margin crenate within. It inhabits the British seas; shell varied with saffron.

SQUAMMOSA. Shell oblong with scaly rays, the interstices broader, and marked with perpendicular striæ. The shell is varied with angular lines and spots; ears wrinkled perpendicular.

DUBIA. Shell roundish, with eighteen rays imbricate with scales. The shell is nearly half an inch long; ears striate transversely.

* **SUBRUFÆ.** Shell with twenty smooth rays, the interstices transversely striate; margin crenate. This is described and figured in Donovan's British Shells. It is found on the British shores, and is about two inches long, and two inches broad.

VERSICOLOR. Shell flattened, with eighteen smooth rays, the interstices cancellate. The shell is of a pale yellow, white, sea-green, blackish, or red; ears transversely striate.

ROSEA. Shell roundish, with five rays. The shell is middle-sized, rosy, with white rays, or green, mixed with yellowish, lurid, and leek-green, with livid rays.

FUSCA. Shell brown, with flat rays that disappear towards the hinge. It inhabits the Indian sea. The shell is white within; lower valve convex, upper valve flat.

TENUIS. Shell thin, flat, purple, with very minute perpendicular striæ crossing circular transverse ones; within the striæ are elevated.

LUTEA. Shell thin, pale yellow, with thick rays.

MURICATA. Shell roundish and white, with a mixture of saffron; the rays convex, and very finely and sharply muricate.

CONSPERSA. Shell roundish, tawny, dotted with white and black; the rays are thick.

NODULOSA. Shell roundish, brown, with black transverse lines and dots; the rays are convex and knotty.

RADIATA. The shell of this species is thin; the colour is whitish-rosy, with white stripes; the rays convex.

PUNCTATA. Shell oblong, pale yellow, spotted with white; beaks varied with white and brown; the rays are crenate. The shell is about two inches long; ears cancellate.

ACULEATA. The shell is thin, varied with rosy and whitish; in form it is rather roundish; the rays are thick, with aculeate scales.

PLANA. Shell thin, flat, white, with a saffron hinge; the rays are round and broad.

PUSILLA. Shell oblong, red, and very minutely striate.

FLAVESCENS. Shell convex on each side, and yellowish within; the rays are convex.

FABELLUM. Shell roundish, deep red, with a white hinge, and a few spots. The rays are smooth.

SPONDYLADES. Shell glabrous red; the ears are equal.

VIOLACEA. Shell flattish on each side, the outside brown, the inside violet. It inhabits the Mediterranean.

AURANTIA. Shell roundish, plaited, and very finely striate longitudinally, with a white semicircular band towards the hinge.

VITTATA. Shell purple within; without with alternate brown and red bands; the rays are convex.

MINIATA. Shell white, with confluent red spots; the rays rough; the convex valve with transverse crisp lamellæ. The shell of this species is about an inch and a half long, and the same in breadth.

INFLATA. Shell convex on each side, closed, oblong, pellucid, with thirty-two rays. This is a very rare species, is ochraceous, thin, and twice as long as it is broad.

b. Ears unequal, one of them generally ciliate, with spines within.

Species.

PALLIUM; Ducal Mantle. Shell equivalve, with twelve convex rays; the scales are striate, rough, and imbricate. There are two other varieties. They are found in India. The shell is solid, red, varied with brown and white; ears striate, crenate, or scaly, one of them longer; margin of the shell denticulate.

SANGUINOLENTA. Shell equivalve, with nine thick obtuse rays; the interstices longitudinally striate, tuberculate, prickly. It is found in the Red sea; resembles the last. The shell is white, with sanguineous spots; the margin with crenate plaits, the border purplish; ears with transverse nodulous striæ.

MACULOSA. Shell equivalve, pale yellow, with tawny spots; twelve rays thick and flattish; ears white, with dull ferruginous marks, and transverse scaly ribs.

NODOSA. Shell with nine rays, covered with apparently vesicular tubercles. There are three varieties. They inhabit the American and African ocean. The shell is sometimes red or scarlet, sometimes varied with red and white, or tawny and white, mixed with yellow; the upper valve is more convex than the lower; the ear is spinous within and beneath.

PES FELIS. Shell with nine striate rough rays; one of the ears very small. It is found on the shores of Africa; is small, thin, pellucid, generally pale flesh-colour, spotted and veined; within glabrous white, with subundulate rays and crenate plaits on the margin; the ears with transverse knotty striæ.

PELLUCENS. Shell nearly equivalve, with nine rays, smooth, with spoon-like hemispherical scales on the lower valve. It inhabits the African seas; is ovate, minute, pellucid, glabrous, white; the upper valve spotted with red.

OBLITERATA. Shell smooth on the outside, with twenty-four doubled rays. It inhabits the Indian ocean. The shell is marked with very fine decussate striæ; the lower valve pale reddish and yellowish at the hinge; upper valve dirty red or pale tawny.

SANGUINEA. Shell equivalve, with twenty-two rough rays; the ears are small. It inhabits the Mediterranean, Atlantic, and American seas. The shell is round and flattish, red, scarlet, or tawny; the spaces between the rays are longitudinally striate.

* **VARIA.**

OSTREA.

* **VARIA.** Shell equivalve, with thirty compressed rays beset with transverse prickly scales; one ear very small. It is found in most European seas; varies very much in colour, from pale yellow to various shades of orange and brown, with sometimes a few white spots. The shell is rather convex, with rough jagged spinous protuberances down the rays; spaces between the rays not striate; one ear very small, with a double row of spines; the other with wrinkled plaits, and armed beneath with from five to seven spines.

* **PUSIO.** Shell equivalve, with about forty filiform rays, the surface often irregular or distorted. This is figured in Donovan's British Shells. It is found in the European, Atlantic, and American seas. The shell is generally small, and a little longer than it is broad; sometimes it is seen with a smooth surface, but mostly with an irregular waved surface, as if deformed by an accident: in its colours and marks it is very variable, but commonly it is of a fine red; one of the ears is very small, the other sharply spined beneath.

* **OBSOLETA.** Shell smooth, equivalve, semitransparent, dark purple, with eight nearly obsolete rays. Inhabits British coasts; three quarters of an inch long. Shell thin, the valves equal and shallow, within smooth and brown, with a pearly gloss; outside dull purplish-brown, with numerous longitudinal striæ between the rays; ears very unequal, wrinkled.

LEVIS. Shell very smooth; ears ribbed. Inhabits Anglesea and Falmouth, is more than half an inch long.

GLABRA. Ears nearly or quite equal. Shell equivalve, with from ten to fifteen smooth flattish rays; the inside with elevated double striæ. It inhabits the European and American seas; nearly two inches long, and as many broad; roundish; red, yellow, or brown, spotted or clouded, sometimes white, with the upper valve spotted with brown; margin repand.

* **OPERCULARIS.** Shell with about twenty rays, roundish and rough, with decussate striæ; the upper valve a little more convex. There is a variety of this species. It inhabits the Northern seas of Europe; and is two inches and a half long and broad. The shell is gaping, generally variegated with spots and other marks; rays acute, sometimes rounded; margin repand and toothed within; ears with decussate wrinkled striæ, the larger one emarginate and spinous under the incisure. In Devonshire and Cornwall, where it is found, it is called *frill* or *queen*.

GIBBA. Shell equivalve, gibbous, with twenty glabrous rays. It inhabits the American and Atlantic seas. The shell is convex on each side, red, with sometimes a few white spots, and marked with fine crenate longitudinal striæ; margin crenate; ears nearly equal.

SULCATA. Shell white, with flesh-colour spots; the rays glabrous, thirty-two on the lower valve, and twenty-five on the upper. It inhabits the shores of Malabar; is about one inch and a half long, and something broader; margin plaited, crenate; lower valve with an emarginate spinous ear, upper valve flattened.

HISTRIONICA. Shell thin, flattened, pellucid, with very fine transverse wrinkles, and eleven rays. The shell is spotted with red, white, and black; rays waved; ears nearly equal.

ISLANDICA. Shell orbicular, with purple circles, and about one hundred rays. It inhabits the Mediterranean, in innumerable varieties. The shell is three inches and a half long, and three inches and a quarter broad; sometimes whitish, but mostly mixed with a fine pale bloom or yellowish, and marked with transverse semilunar bands; upper

valve more elegantly marked, with from fifty to one hundred rays, rough with acute imbricate scales; margin crenate; ears with transverse scaly striæ, the large one emarginate and spinous: the fish is eaten.

TRIRADIATA. Shell nearly equivalve, glabrous, immaculate, with very minute striæ. It is found among fuci in the seas of Norway. The shell is red, with small white spots, within reddish; upper valve with three rays; ovary of the fish yellowish.

FUCI. Shell nearly equivalve, striate, spotted, rough towards the margin. It inhabits the North seas, on the *Fucus saccharinus*. The shell is rufous, with whitish or paler spots, within red, and quite smooth, with pellucid spots; rays of the upper valve obsolete; ovary of the fish rich red.

TIGERINA. Shell nearly equivalve, striate, glabrous, red with whitish spots. It inhabits the North seas, on fuci: lower valve more deeply grooved, and varied with large undulate confluent pale yellow spots; upper valve dotted; ovary of the fish white.

SEPTEMRADIATA. Shell nearly equivalve, striate, glabrous, with seven convex rays. It inhabits the Northern seas.

ARATA. Shell nearly equivalve, within and without grooved and red; one part rough, the other glabrous. It inhabits the North seas.

SENATORIA. Shell convex each side, with twenty-two rounded and transverse wrinkled rays, the interstices with longitudinal granulate striæ. It inhabits the Indian ocean; two inches nine lines long, and about as much broad; outside chestnut varied with violet and white; inside violet, the circumference bordered with dull bay.

CITRINA. Shell orange, with twenty-two rounded rays and plaited margin; lower valve flatter. It inhabits India; some of the rays are scaly, and some of the grooves have granulate lines.

TURGIDA. Shell equally convex, both sides with twenty glabrous rays, the interstices with transverse crowded wrinkles; the margin with plaited teeth. It is found in the American and Indian seas.

SULPHUREA. Shell flattened, thin, pellucid, striate, with numerous imbricate rays; the margin with crenate plaits. It inhabits the Red sea; is two inches long and a little narrower. The shell is thin, fragile, of a sulphur or orange colour, sometimes red with an orange hinge and a semilunar white band, or varied with white and pale tawny, with a sanguineous border; lower valve with equal rays, those of the upper valve alternately less.

PORPHYREA. Shell convex, purple, within white or red, with twenty-five thick rounded scaly rays. It is found in the Red sea; two inches three lines long, and as much broad; shell varied with a few white spots.

VITREA. Shell hyaline with an acute margin, very slender rays, and concentric scaly curves. It is found in the North seas, among fuci and zoophytes; size of a pea; shell smooth, brittle, white, or varied with white and red; one ear emarginate and spinous.

TRANQUEBARIA. Shell with 20 rounded rays, the interstices very finely wrinkled; margin repand. It inhabits Tranquebar; sometimes of one colour, which is mostly orange, sometimes varied with undulate brown, red, or cinereous spots; upper valve more convex.

SAUCIATA. Shell white, with purple spots and numerous unequal rays; the margin crenate. Found in the Red sea.

CRENULATA. Shell oblong, with undulate rays and striæ,

OSTREA.

striæ, and transverse interrupted bands; margin crenulate. This is a very small species.

INNOMINATA. Shell roundish, spotted, with deep grooves very finely striate transversely; margin crenulate. One of the ears hardly visible.

RUFESCENS. Shell roundish, pale rufous, with 24 rays; the ears with decussate striæ. This species is of a middle size.

SQUAMATA. Shell roundish, with thick rays furnished with distant parallel scales, and prickly at the sides. The shell is convex and spotted; the margin crenate.

ANONYMA. Shell rather oblong, with narrow scaly rays, the interstices broader and striate perpendicularly; ears with perpendicular wrinkles. The shell is varied with angular lines and spots.

DECEMRADIATA. Shell flattened, with ten smooth flat unequal rays; ears transversely striate.

TENUIS. Shell thin, with depressed scaly rays; ears short. It is found in India and the North seas. The shell is bay, or cinereous spotted with black, sometimes white or carmine, or pale orange.

VALENTII. Shell with 20 rays, and transverse semilunar bands. It is found in India. The shell is red; it resembles the *O. maxima*, but the ears are unequal.

MEDIA. Shell somewhat oblong, with crowded rays. Shell middle-sized, reddish, saffron or piceous.

CROCEA. Shell saffron, with muricate scaly rays alternately lefts.

FLORIDA. Shell roundish, white, with rosy spots.

ACHROLEUCA. Shell oblong, ochraceous, with rays smooth on one part and granulate on the other.

MUSTELINA. Shell pale tawny, with yellow spots and bands and smooth rays; ears transversely striate. The shell is $2\frac{1}{4}$ inches long, and about as much broad.

FLAMMEA. Shell saffron, rather oblong, with very fine perpendicular striæ.

INCARNATA. Shell rather oblong, flesh-colour, with interrupted red bands and flattened rays. This is small.

GUTTATA. Shell yellowish, rounded, dotted with red, with rays unequally converging at the hinge. It is small.

DEPRESSA. Shell ochraceous, with flat bifid rays. The shell is about an inch long, and something broader.

REGIA. Shell roundish, deep red, with rounded rays. The ear of the lower valve deeply emarginate.

PALLIATA. Shell equivalve, with numerous smooth rays. It resembles *O. pallium*, but is less rough, and has fewer rays; shell straw-colour with purple undulate bands.

SEMINUDA. Shell orange, oblong, muricate, with scales as far as the middle; with 22 rays. The shell is $1\frac{3}{4}$ inch long, $1\frac{1}{4}$ broad; ears with very fine scales.

MODESTA. Shell roundish, hoary, with brownish, reddish, and blueish spots; spaces between the rays broad. The shell has two filiform bands at the hinge.

PRINCIPALIS. Shell purple, with a brown margin; the rays scaly from the middle and smooth at the hinge.

VERSICOLOR. Shell variegated, with pectinate smooth rays.

c. Valves more gibbous on one side.

FLAVICANS. Shell nearly equivalve, with eight striate rays, the margin rounded on one side. It is found in the South seas. The shell is rather oblique, white varied with brown and red, within white; the rays yellow; one of the ears very short.

FASCIATA. Shell equivalve, with 20 rough rays, the interstices striate; ears equal, small. Inhabits the American

and Atlantic seas. The shell is white, pellucid, gaping each side, very finely striate within; the margin crenate.

FRAGILIS. Shell equivalve, with 25 rays; margin very entire; ears acute. It inhabits the Nicobar islands; resembles the last, but is flatter, and has more rays; shell thin, brittle, $1\frac{1}{4}$ inch long, and about half as broad.

LIMA. Shell equivalve, with 22 imbricate scaly rays, rounded at one margin; ears obliterated. It is found in the Mediterranean, Indian, and Red seas. The shell three inches long, $2\frac{1}{2}$ broad; white and rather flat; the number of rays uncertain, the scales elevated and acute; ears wrinkled.

GLACIALIS. Shell equivalve, with 50 imbricate interrupted rays; ears equal, one of them unequally plaited. It is found in the American ocean; resembles the last, but has more numerous rays; shell snowy with a crenate margin; another variety has the margin entire.

HIANS. Shell whitish, thin, gaping each side and oblique, with obsolete undulate rays, and transverse rounded semilunar striæ. Inhabits Norway; $1\frac{1}{2}$ inch long, $\frac{3}{4}$ of an inch broad; ears very small and acute; margin crenate, very entire within.

EXCAVATA. Shell dirty-white, with longitudinal undulate striæ, and a few transverse rings, smooth within; one ear obsolete; margin very entire. It is found in Norway, but is rare; five inches long, $3\frac{1}{4}$ board.

B. Rough and generally plaited on the outside. Oysters.

MALLEUS. Shell equivalve, three-lobed, two of the lobes placed transversely like the head of a hammer. This species is found in the deep parts of the Indian and South seas, and is very rare. Shell about six inches long and $4\frac{3}{4}$ broad; black with a dark blue cast, gaping, formed like a cross; the valves lamellate.

VALSELLA. Shell subpellucid, narrow, elongated, brittle, lamellate; one end rounded; within very smooth and glossy. It inhabits the Red sea; $3\frac{1}{2}$ inches long, one broad. The shell is violet, tawny, or ferruginous, gaping at the hinge; rough on the outside, and thinner at the rounded end.

ANATINA. Shell pellucid, lamellate, and laterally incurved. It inhabits the Nicobar islands; about an inch broad, and including the curvature three inches long; its shape in some measure resembles a duck when sitting; shell thin, brittle, varied with white and violet.

DILUVIANA. Shell plaited on the outside; the margin with erect acutangular teeth. This is found in a fossil state in the calcareous mountains of Sweden, about the size of a common oyster; the margin with erect serratures, formed as it were of the imbricate lamellæ of the shell, and transversely striate; valves with pectinate plaits and acute wrinkles.

FOLIUM. Shell ovate, obtusely plaited at the sides, parasitical. It inhabits the Indian ocean, where it is frequently found adhering to Gorgonia; shell straw-colour, pale tawny, or violet, within silvery; hinge with a triangular hollow; upper valve turgid on the back towards the middle, wrinkled each side and transversely ribbed; lower valve less flatter and grooved in the middle.

ORBICULARIS. Shell orbicular, flat, with an entire crenate margin. Shell with a very obtuse margin, about the size of the end joint of the thumb.

* **EDULIS**, or the common oyster. The shell of this well-known and highly esteemed species is nearly orbicular and rugged, with undulate imbricate scales; one valve is flat and very entire. There are six varieties of this species, found in different parts of the European and Indian seas, affixed to rocks, or in large beds. The shell is of various sizes, forms, and colours, within white, and often glossy like mother-of-pearl.

pearl. The old shells have frequently an *ANOMIA* (which see) fixed to them, and are sometimes covered with *serpulæ*, *lepadæ*, *fertulariæ*, and other marine productions. The oyster is supposed by naturalists to be an hermaphrodite animal. The spawn which they cast in May adheres to the rocks, and other substances at the bottom of the sea, and the shell is said to be formed in the space of 24 hours. It was formerly thought to have no power of locomotion, but it is now ascertained, by accurate observation, that it can move from place to place, and vary its habits according to circumstances. Oysters which are recently taken up from places that are left dry by the sea open their shell, lose their water, and die in a few days; but if kept in reservoirs, in which they are left occasionally by the sea, exposed to the rays of the sun, to severe cold, or are disturbed in their beds, acquire the habit of keeping the shell close when they are uncovered with water, and exist without injury for a long time. Mud and sea-weeds are extremely injurious to the propagation and increase of the oyster. Other shell-fish, and crustaceous animals, as muscles, scallops, star-fish, and crabs, are their most destructive enemies.

Oysters are of different colours in different places; in Spain they are found of a red and russet colour; in Illyria they are brown, but the fish is black, and in the Red sea of the colour of the rainbow. The green oyster, which is eaten in Paris, is brought from Dieppe. The oysters from Brittany have been long famous, but those which are brought from Merennes in Saintonge, are in the highest estimation. In tropical regions, the common oyster is found attached to trees; this assertion has been frequently ranked among groundless and fabulous traditions, but the fact is easily explained. In warm climates, where vegetation is very luxuriant, a great variety of plants, among which are large trees, grow on the shores at the very edge of the sea; and particularly on those places which are sheltered from the agitation of the waves. In such places as the heads of bays and harbours, great abundance of mangrove trees grow up from the bottom, where it is several feet deep, covered with water. It is generally on the mangrove tree that the oyster is found in the West Indies. Without the trouble of picking them from the trees, the branches growing under water, to which they are attached, are cut off, carried home in baskets, and in this state brought to table, where they are eaten raw or roasted.

Britain has long been noted for its oysters; and the ancient Romans, who were extremely fond of this fish, had their layers or stews for oysters as we have at present. Sergius Orata was the inventor of them, as early as the time of Lucius Crassus the orator. He did not, however, construct them for the purpose of indulging his appetite, but for the sake of the profit attached to them. This country still retains its superiority in oysters over other countries. Most of our coasts produce them naturally, and in such places they are taken by DREDGING, (which see), and are a considerable article of commerce, in the raw and pickled state. Stews or layers of oysters are formed in places which nature never allotted as habitations for them. Those near Colchester have long been famous. The oysters or spats are brought to convenient places, where they improve in taste and size. See MILTON.

SEMI-ORATA. Shell oval, slightly eared, smooth, with an oblique base. It inhabits the Mediterranean, is about $1\frac{1}{2}$ inch long, and $1\frac{1}{4}$ broad; of a dirty olive, with a few undulate white lines; very thin; each valve convex and ending in a beak; hinge with five rounded hollows.

* *STRIATA*. Shell oval, with longitudinal filiform ridges; inside green. It is found in European seas, and is about

an inch in diameter. The shell is thick, strong, nearly opaque, not membranous, as in the common oyster, with numerous slender irregular ridges, divided towards the bottom; upper valve flattish, lower concave; hinge broad, deep, somewhat triangular and striate transversely. In many shells is a white radiate mark below the hinge, formed by the cartilage of the fish.

FURNICATA. Shell rough, oblong, linear, with divergent hinges, vaulted internally. It is found in the Red sea. The shell is brittle, membranaceous, tawny, about as long as a finger, terminating at the hinge in an elongated acutangular beak.

SINENSIS. Shell rough, lamellate, unequal, and glabrous within; lower valve larger, concave, and ending in a beak, with ten obtuse plaits. It is found on the Chinese shores; four inches long, and a little narrowed; shell russet-brown, within whitish towards the hinge.

SPONDILOIDEA. Shell equivalve, pellucid, flattened, oval, beaked, glabrous, with perpendicular, undulate, granulate striæ on the upper valve; margin very sharp. Inhabits India: three inches two lines long, two inches five lines broad; shell white, with a few tawny spots.

FORSKAHLII. Shell plaited, and terminating in a long incurved hollow beak; the middle ribs with imbricate spinous wrinkles; the other valve flat. It is found in the Red sea. Two inches three lines long, and about an inch broad; the flat valve whitish, the other nearly violet.

PLICATULA. Shell with longitudinal wrinkled plaits; the lower valve a little less and flatter. It inhabits the American and Mediterranean seas. Varies very much in shape and size; but is generally cinereous, with a mixture of violet, sometimes white, with red or blueish streaks.

ROSTRATA. Shell oblong, rugged; the upper valve lamellate, with a denticulate margin, the other excavated and longitudinally grooved; beak prominent. It inhabits the Mediterranean; upper valve yellowish-green, the other violet, varied with white; within cretaceous or chalky-white.

VIRGINICA. Shell nearly equivalve, thick, rough, lamellous; one valve with a prominent beak. It is found in the American and Indian ocean; nine inches long and four broad; whitish or ochraceous, within glossy-white.

CORNUCOPÆ. Upper valve flat, lower one hollow and striate, rough with scales, wrinkles and plaits, and ending in an elongated beak. It is found in the Indian and African oceans.

PARASITICA. Shell thin; lower valve convex and thicker, the other flat. It inhabits the Indian and Atlantic seas, and fixes itself to the roots and stumps of trees growing close to and hanging over the water, especially the *Mangifera*; varies in form and size, but is often as large as the palm of the hand.

EXALBIDA. Shell thin, the upper valve longer and more convex. This is found in the Adriatic, fixed to other shells, sometimes alone, sometimes several together; about one inch and a half long, but is variable as to shape and size; generally whitish, rarely yellow or violet.

CRISTATA. Shell rugged, with imbricate lamellæ; the margin with obtusely plaited teeth; the beak of one valve produced. Shell an inch long, and ten lines broad, white, with a few black spots; hinge with a broad conic tooth in the middle.

SENEGALENSIS. Shell equivalve, roundish, smooth, flat. It inhabits the shores of Senegal, and adheres to rocks; about two inches in diameter; tawny, within whitish.

STELLATA. Shell thin, depressed, rough, unequal; the upper valve ribbed, the ribs with a few spines. It is found in Guinea sometimes affixed to other bodies by the hinge; sometimes

sometimes round, sometimes oblong; very thin, white, with red or blueish rays, spots, or marks.

OVALIS. Shell oval, very thin, and terminating in a short acute lateral channelled beak; with obsolete, unequal, perpendicular striæ. The shell is about an inch long, brittle, whitish, within glossy silver-white; lower valve exceeding the upper both in length and breadth.

PAPYRACEA. Shell roundish, snowy, very thin, pellucid; upper valve terminating in a short acute beak. It is found firmly fixed with the *Lepas tintinnabulum*.

ANNULATA. Shell equivalve, orbicular, white, with concentric semicircles. It is found in the North seas.

RETUSA. Shell equivalve, oblong, white, glabrous, striate; with an umbo or knob remote from the hinge. This is also found in the North seas.

C. *Hinge with a perpendicular grooved line.*

PERNA. Shell equivalve, obovate, unequal, rounder at one end.

ISOGNOMUM. Shell equivalve, with a larger lobe, nearly forming a right angle with the hinge. There are four varieties of this species. They are found in the Indian ocean and South seas; from five to six inches long, and about one inch and three quarters broad in the middle; shell black, with a violet mixture, and pearly within; lamellate, with an open beak; a very rare shell.

EPHIPPIUM. Shell equivalve, orbicular, compressed, membranaceous. Found in the Indian ocean and Cape of Good Hope; very rare. The shell is about five inches long, five and a half broad, blackish, furruginous or purplish, and pearly within; roundish, lamellate, with a very acute margin.

PICTA. Shell equivalve, thin, pellucid, and pointed at the hinge, the other end dilated; margin very acute. It inhabits the Red sea; is more than an inch broad, and above two long; yellowish-brown, with paler undulate rays.

LEGUMEN. Shell flat, hoary, thin, pellucid, lamellate; hinge with an oblique line; the interstices of the grooves black. This species inhabits the Nicobar islands; is four lines broad, and above two inches long; near the knob is a livid spot.

ALATA. Shell flat, brittle, pellucid, and dilated towards the margin; hinge with an oblique line ending in a small beak. It is found in America.

MYTILOIDES. Shell nearly equivalve, ovate, ventricose, straight. It is found in a fossil state in Alsace.

TORTA. Shell equivalve, intorted. This also is found fossil in Alsace.

PES-LUTRÆ. Shell equivalve, smooth, wedge-shaped, with six obtuse plaits. Shell varied with purplish and white, and marked with very fine longitudinal striæ; the margin slightly scalloped.

OSTRICH, in *Ornithology*. See **STRUTHIO**.

OSTRICONI, in *Geography*, a town of the island of Corfica, near a river of the same name, which runs into the sea; 22 miles W.S.W. of Balsa.

OSTRITZ, or **WOTROW**, a town of Upper Lusatia, on the Neisse; 7 miles S. of Gorkitz. N. lat. $51^{\circ} 1'$. E. long. $15^{\circ} 1'$.

OSTROCOL, a town of Prussia, in Natangen; 9 miles S.S.E. of Lick.

OSTROG, a town of Poland, in Volhynia, once the capital of a duchy, ceded to Poland in 1609; 38 miles N.N.W. of Constantinov.

OSTROGOTHIA. See **GOTHLAND**.

OSTROGOTHS, or **EASTERN GOTHS,** in *Ancient History*, a denomination given to those Goths, who, before they left Scandinavia, inhabited the more eastern parts near the Bal-

tic, in contradistinction to the Westrogoths, or Western Goths, who inhabited that part of Scandinavia which borders on Denmark. The name was afterwards appropriated to those Goths who established themselves on the other side of the Danube, and thus they were distinguished from those who proceeded farther westward and into Pannonia. The emperor Marcian, about A.D. 453, granted to the Ostrogoths the whole of Pannonia from Sirmium, now Scriniss, in Slavonia, to Vindobona, now Vienna, in Austria. They, as well as the other barbarians, acknowledged the authority of the Constantinopolitan emperor, and were subjects of the empire; but at the same time governed by their own princes, to whom the emperor agreed to pay an annual pension, upon their promising to guard the frontiers of the empire, and serve, when wanted, in the Roman armies. Pannonia being granted to the Ostrogoths, the three brothers, who had previously reigned jointly, agreed to divide that country between them, Valemir settling in the eastern part of it, Theodimir in the western, and Vidimir between the other two. They were scarcely established in their new territories, when the sons of Attila, pursuing them even into Pannonia, fell upon Valemir in the vicinity of Sirmium; but that prince, with a small number of men, defeated them with great slaughter, and obliged them to take refuge in that part of Scythia, which bordered on the Danube. About eight years after, the Goths being engaged in a war with the Satagæ, one of Attila's sons, availing himself of that opportunity, entered Pannonia at the head of a considerable army, having ravaged the country; but the Goths, leaving the Satagæ, marched with all their forces against the Huns, who received such a repulse in their onset, that they ever after stood in awe of the Goths, and never offered to molest them.

In the year 455, the emperor Leo, refusing, under various pretences, to pay the Ostrogoths their usual pension, they entered Illyricum, and there committed dreadful ravages; but Anthemius, the son-in-law of the emperor Marcian, obliged them to retire with considerable loss. At length Leo renewed with them ancient treaties, and re-established peace, upon the emperor's promising to pay the Goths their arrears, and for the future 300 pounds weight of gold annually. On the other hand, Valemir sent to Constantinople, by way of hostage, the famous Theodoric, afterwards king of Italy, then only eight years old. Leo received him with respect, maintained him at his court for ten years, in a manner suitable to his rank, and had him instructed by the best masters in every branch of polite literature. In the tenth year of Leo's reign a war broke out between the Goths in Pannonia and the Squiri, who had been permitted by Marcian to settle in Lesser Scythia and Lower Mœsia. Leo took part with the Squiri, who were nevertheless utterly defeated. The Squiri obtaining assistance, renewed the war, and laid waste the territories of the Goths to a great extent. The Goths, putting themselves under the command of the two surviving brothers, Theodimir and Vidimir, Valemir having been previously slain in battle, and engaging the enemy on the banks of the Danube, slew a great number, and obliged the rest to retire beyond that river. Theodimir having gained great success in this contest, received, on his return, his son Theodoric, whom Leo had sent back with rich presents, after having kept him as a hostage for ten years. Theodoric had immediately recourse to arms, and slew the king of the Sarmatians. The Goths in Pannonia determined to make war on the empire. On this occasion part of the Ostrogoths joined the Visigoths in Gaul, and assisted them in the conquest of that country, and in the reduction of Spain, becoming one people with them.

Theodoric entered Illyricum, and with the co-operation of his son Theodoric reduced several cities. Soon after this event a peace was concluded between the Romans and the Goths. Upon the death of Theodoric, his son Theodoric succeeded him; and declared for the emperor Zeno against the usurper Basiliscus. Zeno, however, abandoned him, and Theodoric ravaged Thrace and Macedon. Theodoric afterwards marched into Italy, and A.D. 489, put Odoacer, who had assumed the title of king of Italy, after having put Orestes to death and deposed his son Augustulus, to flight in two successive engagements. Circumstances, however, proving unfavourable, Theodoric had recourse to Alaric, king of the Visigoths, who had settled in Gaul. As the Visigoths and Ostrogoths were originally the same nation, and the Visigoths had received among them, about sixteen years before, a great number of Ostrogoths, they readily granted him the desired supplies; and accordingly he proceeded to besiege Odoacer in Ravenna; and at length reduced all Italy. Having put Odoacer to death, Theodoric was proclaimed by the Goths and acknowledged by the emperor Anastasius, who had succeeded Zeno, king of Italy. (See the biographical article THEODORIC.) Thus the kingdom of the Ostrogoths was established in Italy.

OSTROGOZK, in *Geography*, a town of Russia, in the government of Voronez; 40 miles S. of Voronez. N. lat. 51° . E. long. $38^{\circ} 4'$.

OSTROGZEK, a town of Poland, in Volhynia; 18 miles S.W. of Berdiczow.

OSTROKOLLA, a town of Prussia; 80 miles S.E. of Königsberg.

OSTROLENKA, a town of the duchy of Warsaw; 48 miles N.E. of Warsaw.

OSTROMETKE, a town of Prussia, in the palatinate of Culm; 10 miles S. of Culm.

OSTROPOLE, a town of Poland, in Volhynia; 10 miles N.E. of Constantinov.

OSTROSINA, a town of Croatia; 12 miles S.E. of Carlstadt.

OSTROV, a town of Russia, in the government of Pskov, on the river Velika. N. lat. $57^{\circ} 20'$. E. long. $28^{\circ} 14'$.

OSTROUCHOVSKAIA, a town of Russia, in the country of the Cossacks, on the Choper; 44 miles W.S.W. of Arkadinskaia.

OSTROVITZ, a town of Croatia; 12 miles S. of Bihacs.

OSTROVIZZA, a town and fortress of Dalmatia, which was taken by Soliman, in 1520, and soon after restored to the Venetians; its fortifications are destroyed; 14 miles N. of Scardona.

OSTROVNOE, a lake of Russia, in the government of Kolivan; 120 miles S. of Kolivan. N. lat. $52^{\circ} 24'$. E. long. $80^{\circ} 24'$.

OSTROVSKOI, a town of Russia, in the government of Kostrom; 48 miles E.N.E. of Vetluga.

OSTROW, a town of the duchy of Warsaw; 60 miles E.N.E. of Warsaw.—Also, a town of Poland, in Volhynia; 22 miles S. of Lucko.—Also, a town of Lithuania, in the palatinate of Novogrodek; 44 miles S. of Novogrodek.

OSTROWIEC, a town of Lithuania, in the palatinate of Wilna; three miles E. of Wilna.

OSTROZECK, a town of Poland, in Volhynia; 42 miles W.N.W. of Zytomiers.

OSTRYA, or OSTRYS, in *Botany*, *osyus* of Theophrastus, is by some taken for the Lilac, *Syringa vulgaris*; but the description of that ancient writer far better accords

with the Hornbeam, *Carpinus Betulus*, which therefore is usually taken for his *osyus*. The "thick fibres, folds, and serratures" of the leaf, are characteristic of the latter, not of the former. Linnæus retains the name as a specific appellation for the Italian, or Hop, Hornbeam, (see *CARPINUS*, sp. 4.) which is so remarkable for its white, inflated, hop-like fruit.

OSTRYNIA, in *Geography*, a town of Lithuania, in the palatinate of Wilna; 20 miles W.S.W. of Lidda.

OSTUALLA, a town of Norway; 50 miles N. of Frederickstad.

OSTUNI, a town of Naples, in the province of Otranto, the see of a bishop, suffragan of Brindisi, containing two churches and five monasteries; 51 miles N.W. of Otranto. N. lat. $40^{\circ} 59'$. E. long. $17^{\circ} 38'$.

OSUNA, a town of Spain, in the province of Seville; 12 miles S.S.W. of Ecija.

OSUNPOUR, a town of Hindoostan, in Bengal; 45 miles N.N.E. of Dacca. N. lat. $24^{\circ} 25'$. E. long. $90^{\circ} 48'$.

OSWALD, in *Biography*, king of Northumberland, was obliged, after the death of Ethelfrid, his father, to take refuge in Ireland, his uncle Edwin having taken possession of the throne. In his retreat he became a Christian, and returning to his own country, defeated Cerdwalla, or Cædwalla, king of the Britons, who lost his life in the contest. This was the last vigorous effort which the Britons made against the Saxons. Oswald re-united the two kingdoms of Northumberland, but was slain in battle against Penda, king of Mercia, A.D. 643. Oswald is much celebrated for his sanctity and charity by monkish historians; and they pretend that his reliques wrought miracles, particularly in the cure of a sick horse, which had approached the place of his interment. Hume.

OSWALD, ERASMUS, a learned German, professor of the mathematics and of the Hebrew language, was born in the county of Merckenstein, in Austria, in the year 1511. Having gone through a course of grammar learning, he studied successively at the universities of Ingolstadt, Leipzig, and Basil, and in the last named place he distinguished himself by his proficiency in the mathematical sciences and the Hebrew tongue, under the instructions of the celebrated Sebastian Munster. From Basil he went to Memmingen, in Swabia, on an invitation from the magistrates to become mathematical professor in that city; and afterwards he went to Tübingen, and was elected professor of Hebrew. In imitation of Sebastian Munster, he did not confine his instructions to the Hebrew language only, but delivered a course of lectures in the mathematics. In 1552 he accepted of the united professorships of mathematics and Hebrew at Friburg, which he held for more than twenty-seven years. He died in 1579, in the sixty-ninth year of his age. He was author of "Commentaria in Theorias Planetarum;" "De primo mobili;" "Commentaria in Sphæram Joannis de Sacrobosco;" "In Almagestum Ptolomæi Annotationes;" "Genium Kalendarium;" "Oratio funebris de Obitu Sebastiani Munsterii," written in the Hebrew language. He likewise translated the New Testament into Hebrew, an undertaking on which no person had ventured before his time. He was author of paraphrases on several books of the bible, and other works.

OSWALD, in *Geography*, a small island in the gulf of Florida, near the coast of East Florida. N. lat. $25^{\circ} 48'$. W. long. $80^{\circ} 22'$.

OSWALD, *St.*, a town of Austria; 5 miles N. of Rosbach.—Also, a town of the duchy of Stiria; 11 miles N.E. of Windisch Gratz.—Also, a town of Austria; 8 miles S.W. of Neustadt.—Also, a town of the duchy of Stiria; 6 miles S. of

S. of Landsparg.—Alfo, a town of Austria; 5 miles E. of Freyftatt.—Alfo, a town of Upper Carniola; 11 miles E. of Stein.

OSWANSIO, a town of Sweden, in Geftricia; 17 miles W.S.W. of Gefle.

OSWEGATCHIE, a river of North America, which runs a north-westerly courfe from its fource into St. Lawrence county, New York; after fome windings it purfues a westerly courfe by the northern part of a lake of its name, the waters of which it receives, and then runs feven miles N.W. into the St. Lawrence. The lake of this name is about 18 miles long from S.W. to N.E., and fends its waters north-westward into the river of its name. It is about ten miles N.E. of the Thoufand lakes, near the entrance into lake Ontario.

OSWEGATCHIES, an Indian tribe refiding at Swagatchey, on the river St. Lawrence, in Canada. Thirty years ago they could furnifh about 100 warriors.

OSWEGO, a navigable river of New York, which conveys the waters of Oneida, and a number of fmall lakes, into lake Ontario. It is more commonly called *Onondago*.—Alfo, a fortrefs on the east fide of the mouth of the above river, and S.E. fide of lake Ontario. N. lat. $43^{\circ} 20'$. W. long. $75^{\circ} 43'$. It was taken by the British from the French in 1756, and confirmed to them by the peace of 1763. It was delivered up to the United States July 14, 1766. It is about 150 or 160 miles E. by N. of Niagara. N. lat. $44^{\circ} 43'$. W. long. $76^{\circ} 50'$.

OSWEGO Creek, Great, lies in the county of Lincoln, Upper Canada, and runs into the river Welland, above the Little Oswego creek, near the N.W. part of the township of Wainfleet.

OSWEGO Tea, in Botany. See MONARDA.

OSWESTRY, in Geography, a borough, market-town, and parish, in the hundred of Oswestry, and county of Salop, England, is fituated on the great road from London to Holyhead, at the diftance of 18 miles from Shrewsbury, and $179\frac{1}{2}$ from the metropolis. The town ftands upon higher ground than any other in Shropshire, and the country around is delightfully varied with hills, vales, wood, and water, and exhibits fome very rich and picturesque fcenery. It is a borough by prefcription, and is governed by a mayor, recorder, high fteward, town-clerk, murenger, coroner, and other inferior officers. The body corporate confifts of the mayor, twelve aldermen, and fifteen common councilmen, who elect the mayor, recorder, and murenger; but the high fteward and town-clerk are nominated by the lord of the manor, and the office of coroner is always held by the chief magiftrate of the preceding year. The petty fefions for the hundred are holden here, befides the courts connected with the borough. Wednesday and Saturday of every week are the market-days in this town, and there are fix fairs annually. Here is an excellent free grammar-fchool, of recent erection. The church is a very fpacious building, with a plain, well proportioned tower at one end. Oswestry has been much improved within the laft two years, in confequence of an act obtained, in 1810, for widening, paving, and lighting the ftreets, and of the fpirit of building which has refulted from that meafure. According to the parliament returns of 1811, the houfes in the town were 788, and the inhabitants 3479, in number.

Oswestry is a town of great antiquity. The Saxons called it Maeferfeld, or Macerfelth, fignifying the acorn-field; and the Britons Tre-evefan-gluddiu in Urbern, Tre-Kadari, or the town of Great Oaks. Its prefent appellation, which is a corruption for Oswaldftre, was derived

from the name of St. Oswald, king of Northumberland, who was defeated and flain here by Penda, king of Mercia, one of the moft cruel and bloody tyrants that ever difgraced a throne. Subfequently, when the great Offa constructed the barrier ftill known by his name, Oswestry flood between it and Watt's-dyke, which ran parallel to the former, at the diftance of two miles. It was thus rendered a border-town, and hence was frequently the fcene of conteft, firft between the Saxons and the Britons, and afterwards between the latter and the Normans. Henry II. lay here previous to his defeat by the Welch on the Berwin mountains. In 1212 king John burnt both the town and cattle, which were then in the poffeffion of the Fitz-Alans, and plundered a part of Wales, on account of the refusal of Llewellyn to join his ftandard, in oppofition to Lewis, the dauphin of France, who had been invited to England by the rebellious barons. Oswestry was likewise destroyed by the Welch prince, called Llewellyn the Great, in 1233. During this period it was encircled by a ftong wall, which had four gates fronting the four cardinal points. Some traces of the wall ftill remain, but the gates were entirely demolished about the year 1769. Of the caftle, which flood on a high, artificial mount at the west fide of the town, only a few fragments now exift. Thefe, however, are fufficient to indicate its former prodigious ftrength, and confequent importance, as a place of defence.

South from Oswestry is fituated the elegant manfion of Afton-park, the property of W. Lloyd, efq.; and near the village of Weft-Felton, in this neighbourhood, is the villa of John F. M. Dovafton, efq. called "The Nurfery." This gentleman has, within thefe few months, published a volume of poems, which may juftly entitle him to hold a high rank among the poets of the age. His father, though he never appeared as an author, was a man of fingular genius, and has left a large collection of MSS. on the fubject of antiquities, now in the poffeffion of his fon, together with a variety of philofophical and mufical inftruments constructed by his own hands, and upon new principles. About a quarter of a mile north-east from Oswestry is an ancient fortification called Old-Fort, which the Welch formerly denominated Llys-Ogran, or Caer-Ogran, that is, Ogran's palace, or ftong-hold. It confifts of three deep entrenchments, encircling a natural eminence, having a fudden afcent on all fides. Beyond this ftand the venerable ruins of Whittingham-caftle, which was built more than a century before the conqueft, and after that event became a baronial refidence of the Montgomeries, the Peverells, and the Fitz-guarines. The fituation of this caftle is extremely picturesque; its eaftern walls being wafhed by a fine lake, shaded with large, old oaks, and having a fmall iflet in its centre, covered with tall Wych-elms and afh-trees. Knockin-caftle, about five miles from Oswestry, was built by lord L'Eftange, or Strange, and continued in the poffeffion of his family till the reign of Edward IV., when it paffed into the family of the Stanlies, earls of Derby. The village here had formerly a weekly market, and fairs, and was a place of confiderable importance. Chirk-caftle, on the confines of Denbighfhire, ftands on the fcite of a more ancient fortrefs, called Caftell-Crogen, which was demolished in the reign of Edward I., and the prefent ftructure erected in its ftcad, by Roger Mortimer. In the time of the civil wars between king Charles and his parliament, this caftle was the property of fir Thomas Middleton, the celebrated parliamentary general, whose defcendants, by the female line, ftill poffefs it. It is a fquare building, ftrengthened at the angles by mafly baftion-like towers, and having a court in the centre. A

picture gallery in this edifice contains a large collection of portraits. Beauties of England and Wales, vol. xiii. by J. Nightingale and R. Rylance, and vol. xvii. by J. Evans.

OSWIECZIN, a town of Poland, in the palatinate of Cracow, on the Vistula; 32 miles W. of Cracow.

OSYMANDYAS, in *Biography*, an Egyptian king, and the first monarch who formed a library, caused a colossal statue of himself to be erected, on which was this inscription; "I am Osymandyas, king of kings; whoever will dispute this title with me, let him surpals my works." Mozeri.

OSYRIS, in *Botany*, *osyris* of Dioscorides, which he describes as "a small shrub, with numerous, dark, tough branches;" so that professor Martyn's conjectural derivation of the name from *osyris*, a branch, is very probably just. Some take *Antirrhinum Linaria* for the true *Osyris*.—Linn. Gen. 515. Schreb. 677. Mart. Mill. Dict. v. 3. Ait. Hort. Kew. ed. 1. v. 3. 394. Juss. 75. Lamarck Illustr. t. 802. (Casia; Tourn. t. 488).—Class and order, *Dioecia Triandria*. Nat. Ord. *Calyciflorae*, Linn. *Elæagni*, Juss.

Gen. Ch. Male, *Cal.* Perianth of one leaf, turbinate, in three equal, ovate, acute, spreading segments. *Cor.* none, except a three-fold, marginal, nectariferous gland. *Stam.* Filaments three, very short, inserted into the calyx; anthers roundish, small. *Pist.* an abortive rudiment.

Female, *Cal.* shaped like that of the male, superior, permanent, very small. *Cor.* none, as in the male. *Stam.* as in the male, but abortive. *Pist.* Germen turbinate, inferior; style the length of the stamens; stigma in three deep spreading segments. *Peric.* Drupa globose, umbilicated, of one cell. *Seed.* Nut globose, filling the cavity of the pericarp.

Ess. Ch. Male, Calyx three-cleft. Corolla none.

Female, Calyx three-cleft. Corolla none. Stigma in three deep segments. Drupa umbilicated, of one cell. Nut globose.

1. *O. alba*. Poet's Casia, or Gardrobe. Linn. Sp. Pl. 1450. Scop. Carn. v. 2. 260. (Casia poetica monspeliensis; Camer. Epit. 26. C. poetica Lobelii; Ger. em. 1293).—Leaves linear-obovate. Flower-stalks axillary.—Native of the south of Europe. It has been brought into our greenhouses, but having nothing to recommend it, and scarcely ever flowering, is now hardly to be met with. The stem is shrubby, much branched, angular, hard and rigid, with the aspect of some kind of broom. Leaves alternate, an inch long, obovate, very narrow, entire, smooth, evergreen, rather glaucous. Flowers small, greenish, on short, simple, axillary stalks. Fruit scarlet, the size of a currant.

Scopoli would unite under this genus the *Elæagnus* and *Hippophae* of Linnæus, to which he was led by theoretical principles, without regard to nature, or to genuine rules of systematic arrangement.

2. *O. japonica*. Japanese *Osyris*. Thunb. Jap. 31. Murray in Linn. Syst. Veg. ed. 14. 881.—Leaves ovate. Flower-stalks from the rib of the leaf. Native of mountains in Japan. Stem shrubby, six feet high, with smooth, flexible, round branches. Leaves alternate, abundant about the tops of the branches, stalked, ovate, pointed, with bristly serratures, ribbed, smooth on both sides, unequal, an inch long or more. Flower-stalks about eight, collected into an umbel, from the midrib of the leaf, a line in length. Fruit unknown, so that Thunberg was uncertain as to the genus; yet he did not conceive that he had materials sufficient to establish a new one. The serrated leaves are remarkable, considering the other characters, or one might suspect this plant to be partly allied to the *Asparagus*.

OSYRIS, in *Gardening*, contains a plant of the shrubby kind, of which the species cultivated is, the poet's casia, (*O. alba*).

Method of Culture.—These plants are increased, by sowing the berries in autumn, as soon as ripe, in some gravelly, stony, or similar situation, on the side of a rising ground, either in the places where the plants are to remain, which is the most successful, or in a nursery-bed for transplanting. As the seeds often remain two years before they vegetate, the places should be kept clear from weeds during that time, or till the plants appear. They afterwards require only to be freed from weeds.

They afford variety in beds, borders, or other places, by the beauty of their fruit.

OSZMIANA, OSCKMIANA, or *Osmiana*, in *Geography*, a town of Lithuania, in the palatinate of Wilna, the principal place of a district, where provincial diets and justice-courts are held; 28 miles S.E. of Wilna.

OTABALO, a jurisdiction of South America, in the province of Quito, connected on the S. with that of San Miguel de Ibarra. The lands are laid out in plantations, and produce great quantities of sugar. The Indians in the villages, and also those who are independent, manufacture great variety of cottons, viz. carpets, pavilions for beds, quilts in damask work, wholly of cotton, either white, blue, or variegated with different colours; all which are highly valued in the provinces of Quito and Peru, where they are disposed of to great advantage. The wheat and barley are sown here, like Indian corn, in little holes, a foot distant from each other, into each of which are dropped five or six grains; and they generally reap above a hundred-fold. This jurisdiction abounds with horses and black cattle; and from the milk of the latter large quantities of cheese are made. The fertility of the country is very much promoted by a great number of rivulets. Its flocks of sheep are also numerous, though they seem to be neglected by the inhabitants. The principal place in this jurisdiction is Otabalo, which is so large and populous, that it is said to contain 18,000 or 20,000 persons, and among these a considerable number of Spaniards; 30 miles N. of Quito. N. lat. 0° 15'. W. long. 77° 56'.

OTACUSTIC, formed from *os* *akos*, ear, and *akustw*, I hear, a term applied to instruments which aid or improve the sense of hearing. See ACOUSTIC.

OTAHA, in *Geography*, one of the Society islands, in the South Pacific ocean, situated two miles N. of Ulietea, and both inclosed within one reef of coral rocks, so that there is no passage for shipping between them. Otaha affords two very good harbours, one on the east side, called "Ohamene," and the other on the W., called "Ohererua," which is pretty large, and affords good anchorage in 20 and 25 fathoms, nor is there any want of fresh water. The land of Otaha, as well as that of Ulietea, is hilly, broken, and irregular, except on the sea-coast; yet the hills appear green and pleasant, and are in many places clothed with wood. This island was conquered by the king of Bolabola. S. lat. 16° 33'. W. long. 151° 20'.

OTAHETE, called by Capt. Wallis *King George the Third's Island*, an island in the South Pacific ocean, about 30 leagues in circumference, supposed to have been first seen by Quiros, in the year 1606, and called by him "Sagittario." Capt. Wallis was the first Englishman who discovered it, in 1767, and he also examined and described it. For his account of it see Hawkesworth's Voyages, vol. i. In 1768 it was visited by Monf. Bougainville, and again by Capt. Cook, in the years 1769, 1773, and 1774. From his account

OTAHEITE.

count of it, as drawn up by Dr. Hawkefworth, we shall extract the following particulars. Our celebrated navigator came to an anchor on the 13th of April, 1769, in Port-royal bay, called by the natives "Matavai." He and his companions were hospitably received by the natives, who brought them in their canoes cocoa-nuts, fruit resembling apples, bread-fruit, and some small fishes, in exchange for beads and other trifles. On the 24th, Mr. (sir Joseph) Banks and Dr. Solander examined the country for several miles along the shore to the eastward, which for about two miles was flat and fertile; and afterwards the hills stretched quite towards the water's edge, and a little farther ran out to the sea, so that they were obliged to climb over them. These hills, which were barren, continued for about three miles more, and then terminated in a large plain, which was full of good houses, and of people who appeared to live in great affluence. Here was a river, much more considerable than that at the fort of the navigators, which issued from a deep and beautiful valley, and at some distance from the sea it was 100 yards wide. About a mile beyond this river, the country became again barren, the rocks every where projecting into the sea, so that they resolved to return from this excursion. Soon after the queen of the island, named "Oberea," was introduced to them. She seemed to be about 40 years of age, was tall, and of a large make; her skin was white, and her eyes were animated by an uncommon degree of intelligence and sensibility: she appeared to have been handsome when young, but few memorials of her beauty now remained. On the 26th of June, Cook and Mr. Banks set out in the pinnace to make a circuit of the island, in order to sketch out the coast and harbours. Taking their route to the eastward, they went on shore in a district called "Oahonue," governed by a young chief called Ahio. They then proceeded to the harbour, in which M. Bougainville lay, called "Ohidea." This harbour lay on the W. side of a great bay, under shelter of a small island, called "Boourou," near which is another, called "Taawirri." In their farther progress, they reached a low neck of land, or isthmus, at the bottom of the bay, that divides the island into two peninsulas, each of which is a district or government wholly independent of the other. From Port-royal the coast trends E. by S. and E.S.E. 10 miles, then S. by E. and S. 11 miles to the isthmus. In the first direction the shore is in general open to the sea; but in the last it is covered by reefs of rocks, which form several good harbours with safe anchorage, and other conveniences. The adjacent country was a marshy flat about two miles over, across which the natives haul their canoes to the corresponding bay on the other side. They then prepared to continue their route for what their guide, "Tituboalo," called the other kingdom; he said that the name of it was "Tiarrahou," or "Otaheite Ete," and that of the chief who governed it "Waheatua:" they also learnt that the name of the peninsula, where they had taken their station, was "Opoureonu," or "Otaheite Nuz." After rowing a few miles, they landed in a district which was the dominion of a chief called "Maraitata," the burying-place of men. They then proceeded to the district which was immediately under the government of the principal chief, or king of the peninsula, "Waheatua." This district consists of a large and fertile plain, watered by a river so wide, that they were obliged to ferry over it in a canoe. In this place no house appeared to be inhabited, but the ruins of many that had been very large were perceived. Proceeding along the shore, which forms a bay, called "Oaitipaha," they found the Chief sitting near some pretty canoe awnings, under which it was supposed he and his attendants slept.

Hence they passed through a country that appeared to be more cultivated than any that had been seen in any other part of the island. The houses were neither large nor numerous, but the canoes, which were innumerable, were superior, both in size and structure, to any that had been seen before. At almost every point there was a sepulchral building, and there were many of them also inland. But though this part of the country was fertile and cultivated, no bread-fruit was found; the trees were bare, and the inhabitants seemed to subsist upon nuts, resembling chestnuts, and which they called "Ahee." As they proceeded they came abreast of a small island called "Otooalette:" they next advanced round the S.E. point, part of which is not covered by any reef, but lies open to the sea; and here the swell rises directly from the shore. At the southernmost part of the island the shore is again covered by a reef, which forms a good harbour, and the land about it is very fertile. In a long house at the S.E. end of the island, they saw what was altogether new to them: at one end of it, fastened to a semicircular board, hung 15 human jaw-bones, which appeared to be fresh, and there was not one of them that wanted a single tooth. Much as they were surprised, and anxious as they were in their inquiries concerning this circumstance, they could obtain no information. Quitting this situation, they were piloted over the shoals by the chief "Mathiabo," who wished to accompany them; and opened the bay on the N.W. side of the island, which answered to that on the S.E., so as at the isthmus, or carrying place, almost to intersect the island, and when they had coasted about two-thirds of it, they determined to go on shore for the night. Here they were hospitably received in the house of the chief of the district, whose name was "Wiverou." This place is situated on the N. side of "Tiarrahou," the S.E. peninsula, or division of the island, and at the distance of about five miles S.E. from the isthmus, having a large and commodious harbour, inferior to none in the island, about which the land is very rich in produce. Without much communication with this division, they were every where received by the inhabitants in a very friendly manner: the whole district was fertile and populous, and apparently in a more flourishing state than "Opoureonu," though not above one-fourth part as large. The next district in which they landed was the last in "Tiarrahou," and governed by a chief, whose name was "Omoe." Leaving Omoe, they proceeded on their return, and soon reached Opoureonu, the N.W. peninsula. Here they saw a repository for the dead, uncommonly decorated; the pavement was very neat, and upon it was raised a pyramid, about five feet high, entirely covered with the fruits of two plants, peculiar to this country. Near the pyramid was a small image of stone, of very rude workmanship, and the first instance of carving in stone that had been seen among these people. It was covered by a shed, and seemed to be highly valued. They then passed through the only harbour on the S. side of Opoureonu, that is fit for shipping. It is situated about five miles to the westward of the isthmus, between two small islands that lie near the shore, and about a mile distant from each other, and affords good anchorage. Here they were not far from the district called "Paparra," which belonged to their friends Oamo and Oberea, where they proposed to sleep. Taking up their quarters at the house of Oberea, though she was absent, they determined to lodge there: the house was neat, though small, and had at this time no inhabitant but her father, who received them kindly. Here they surveyed the "Morai" of Oamo and Oberea, which is an enormous pile, and the principal piece of Indian architecture in the island. (See MORAI.) Having passed the night, in perfect security and quiet, they arrived

arrived before the next evening at "Atahourou," the residence of their friend "Tootahah," where they were well entertained. The next day, Saturday, July the 1st, they got back to their fort at Matavai, having found the circuit of the island, including both peninsulas, to be about 30 leagues. On the 3d of this month Mr. Banks, with some Indian guides, set out to trace the river up the valley from which it issues. For about six miles they met with houses, not far from one another, on each side of the river, and the valley was every where about 400 yards wide. Having been refreshed at the last house they met with, and having walked about six miles further, they passed under vaults formed by fragments of the rock, and soon after found the river banked by steep rocks, from which a cascade, falling with great violence, formed a pool so deep, that the Indians said they could not pass it. The stones, which Mr. Banks examined, exhibited, like those of Madeira, manifest tokens of having been burnt: traces of fire are also manifest in the very clay upon the hills; so that it may be presumed, that this and the neighbouring islands, are either shattered remains of a continent, which some have supposed to be accessary to this part of the globe, to preserve an equilibrium of its parts, which were left behind when the rest sunk by the mining of a subterraneous fire, so as to give a passage to the sea near it; or were torn from rocks, which, from the creation of the world, had been the bed of the sea, and thrown up in heaps, to a height which the waters never reach.

Among the natives who almost were constantly with our navigators, was "Tupia," who had been the first minister of Oberea, when she was in the height of her power; he was also the chief "Takowa" or priest of the island, and consequently well acquainted with the religion of the country, both as to its ceremonies and its principles. He had also great experience and knowledge in navigation, and was particularly acquainted with the number and situation of the neighbouring islands. He was therefore an instructive and useful companion; and expressed a desire to accompany our navigators, with which they cheerfully complied. The best articles for traffic in this island were axes, hatchets, spikes, large nails, looking glasses, knives, and beads, for some of which every thing which the natives possess may be procured. They are indeed fond of fine linen cloth, both white and printed: but an ax worth half a crown will fetch more than a piece of cloth worth 20s.

Otaheite is surrounded by a reef of coral rocks, which forms several excellent bays and harbours, where there is room and depth of water for any number of the largest ships. Port-royal, or Matavai, which is not inferior to any, may be easily known by a very high mountain in the middle of the island, which bears due S. from Point Venus. The best anchoring is on the E. side of the bay, with 16 and 14 fathom upon an oozy bottom. The shore of the bay is a fine sandy beach, behind which runs a river of fresh water, so that any number of ships may be supplied without incommoding each other.

The face of the country, except that part of it which borders upon the sea, is very uneven; it rises in ridges that run up into the middle of the island, and there form mountains, which may be seen at the distance of sixty miles; between the foot of these ridges and the sea is a border of low land, surrounding the whole island, except in a few places where the ridges rise directly from the sea: the border of low land is in different parts of different breadths, but no where more than a mile and a half. The soil, except on the very tops of the ridges, is extremely rich and fertile, watered by a great number of rivulets of excellent water, and covered with fruit-trees of various kinds. The low land that

lies between the foot of the ridges and the sea, and some of the vallies, are the only parts of the island that are inhabited, and here it is populous: the houses do not form villages or towns, but are ranged along the whole border, at the distance of about fifty yards from each other, with little plantations of plantains, the tree which furnishes them with cloth. The whole island, according to the best information, could furnish 6780 fighting men, from which the number of inhabitants may easily be computed. The produce of this island is bread-fruit, cocoa-nuts, bananas of thirteen sorts, plantains, a fruit not unlike an apple, which, when ripe, is very pleasant; sweet potatoes, yams, cocoas, a kind of arum; a fruit known here by the name of jambu, and reckoned most delicious; sugar-cane, which the inhabitants eat raw; a root of the saloop kind, which the inhabitants call pea; a plant called ethee, of which the root only is eaten; a fruit, that grows in a pod, like that of a large kidney bean, which, when it is roasted, eats very much like a chestnut, by the natives called ahee; a tree called wharra, called in the East Indies pandanus, which produces fruit something like the pine apple; a shrub called nono; the morinda, which also produces fruit; a species of fern, of which the root is eaten, and sometimes the leaves: and a plant called theve, of which the root also is eaten: but the fruits of the nono, the fern, and the theve, are eaten only by the inferior people, and in times of scarcity. All these, which serve the inhabitants for food, the earth produces spontaneously, or with little culture. They have no European fruit, garden-stuff, pulse, or legumes, nor grain of any kind. Of tame animals, they have only hogs, dogs, and poultry; neither is there a wild animal in the island, except ducks, pigeons, parrots, with a few other birds, and rats, there being no other quadruped, nor any serpent. But the sea supplies them with great variety of most excellent fish, to eat which is their chief luxury, and to catch it their principal labour. As to the people, they are of the largest size of Europeans. The men are tall, strong, well-limbed, and finely shaped. The women of the superior rank are also, in general, above our middle stature, but those of the inferior class are rather below it, and some of them are very small. This defect in size probably proceeds from their early commerce with men, the only thing in which they differ from their superiors, that could possibly affect their growth. Their natural complexion is that kind of clear olive or brunette, which many people in Europe prefer to the finest white and red. The skin is delicately smooth and soft; they have no tint in their cheeks, which we distinguish by the name of colour. The shape of the face is comely, the cheek bones are not high, neither are the eyes hollow, nor the brows prominent; the only feature that does not correspond with our ideas of beauty is the nose, which, in general, is somewhat flat: but their eyes, especially those of the women, are full of expression, sometimes sparkling with fire, and sometimes melting with softness; their teeth are, almost without exception, most beautifully even and white, and their breath perfectly without taint. The hair is almost universally black, and rather coarse. The men have beards, which they wear in many fashions, always, however, plucking out great part of them, and keeping the rest perfectly clean and neat. In their motions there is at once vigour and ease; their walk is graceful, their deportment liberal, and their behaviour to strangers and to each other affable and courteous. In their dispositions, also, they seemed to be brave, open, and candid, without either suspicion or treachery, cruelty or revenge. They were, however, all thieves; and when that is allowed, they need not much fear a competition with the people of any other nation upon earth. The women

always cut their hair short round their ears, and the men, except the fishers, who are almost continually in the water, suffer it to flow in large waves over their shoulders, or tie it up in a bunch on the top of their heads. They have a custom also of anointing their heads, with what they call "monoe," an oil expressed from the cocoa-nut, in which some sweet herbs or flowers have been infused: as the oil is generally rancid, the smell is at first very disagreeable to an European, and as they live in a hot country, and have no such thing as a comb, they are not able to keep their heads free from lice, which the children and common people sometimes pick out and eat; a hateful custom, wholly different from their manners in every other particular, for they are delicate and cleanly almost without example; and those to whom captain Cook distributed combs, soon delivered themselves from vermin, with a diligence which shewed that they were not more odious to us than to them. They have a custom of staining their bodies, nearly in the same manner as is practised in many other parts of the world, which they call "tattooing." They prick the skin, so as just not to fetch blood, with a small instrument, something in the form of a hoe; that part which answers to the blade is made of a bone or shell, scraped very thin, and is from a quarter of an inch to an inch and an half wide; the edge is cut into sharp teeth or points, from the number of three to twenty, according to its size: when this is to be used, they dip the teeth into a mixture of a kind of lamp-black, formed of the smoke that rises from an oily nut, which they burn instead of candles, and water: the teeth, thus prepared, are placed upon the skin, and the handle to which they are fastened being struck, by quick smart blows, with a stick fitted to the purpose, they pierce it, and at the same time carry into the puncture the black composition, which leaves an indelible stain. The operation is painful, and it is some days before the wounds are healed. It is performed upon the youth of both sexes, when they are about twelve or fourteen years of age, on several parts of the body, and in various figures, according to the fancy of the parent, or perhaps the rank of the party. The women are generally marked with this stain, in the form of a Z, on every joint of their fingers and toes, and frequently round the outside of their feet: the men are also marked with the same figure, and both men and women have squares, circles, and crescents, and ill-designed representations of men, birds, or dogs, and various other devices, impressed upon their legs and arms, some of which, we were told, had significations, though we never could learn what they were. But the part on which these ornaments are lavished with the greatest profusion, is the breech: this, in both sexes, is covered with a deep black; above which arches are drawn one over another as high as the short ribs. These arches are their pride, and are shewn both by men and women with a mixture of ostentation and pleasure. The face in general is left unmarked. Some old men had the greatest part of their bodies covered with large patches of black deeply indented at the edges, like a rude imitation of flame; but our navigators were told, that they came from a low island called "Noouoora," and were not natives of Otaheite. Their clothing consists of cloth or matting of different kinds. The cloth, which will not bear wetting, they wear in dry weather, and the matting when it rains; they are put on in many different ways, just as their fancy leads them; for in their garments nothing is cut into shapes, nor any two pieces sewed together. The drefs of the better sort of women consists of three or four pieces: one piece, about two yards wide, and eleven yards long, they wrap several times round their waist, so as to hang down like a

petticoat, as low as the middle of the leg, and this they call "parou:" two or three other pieces, about two yards and a half long, and one wide, each having a hole cut in the middle, they place one upon another, and then putting the head through the holes, they bring the long ends down before and behind; the others remain open at the sides, and give liberty to the arms; this, which they call the "tebuta," is gathered round the waist, and confined with a girdle or sash, of thinner cloth, which is long enough to go many times round them, and exactly resembles the garment worn by the inhabitants of Peru and Chili, which the Spaniards call "poncho." The drefs of the men is the same, except that instead of suffering the cloth that is wound about the hips to hang down like a petticoat, they bring it between their legs, so as to have some resemblance to breeches, and it is then called "maro." Upon their legs and feet they wear no covering, but they shade their faces from the sun with little bonnets, either of matting or of cocoa-nut leaves, which they make occasionally in a few minutes. This, however, is not all their head-dress; the women sometimes wear little turbans, and sometimes a drefs which they value much more, and which, indeed, is much more becoming, called "tomou:" which consists of human hair, plaited in threads, scarcely thicker than sowing filk. Sir Joseph Banks has pieces of it above a mile in length, without a knot. Their personal ornaments, besides flowers, are few; both sexes wear ear-rings, but they are placed only on one side: when our navigators came, they consisted of small pieces of shell, stones, berries, red peas, or some small pearls, three in a string; but the beads brought by captain Cook very soon supplanted them all. The children go quite naked; the girls till they are three or four years old, and the boys till they are six or seven. The houses, or rather dwellings of these people, are all built in the woods, between the sea and the mountains, and no more ground is cleared for each house, than just sufficient to prevent the dropping of the branches from rotting the thatch with which they are covered; from the house, therefore, the inhabitants step immediately under the shade, which is the most delightful that can be imagined. It consists of groves of bread-fruit and cocoa-nuts, without underwood, which are intersected, in all directions, by the paths that lead from one house to the other. The ground on which the house is built is an oblong square, twenty-four feet long, and eleven wide; over this a roof is raised, upon three rows of pillars or posts, parallel to each other, one on each side, and the other in the middle. The utmost height within is about nine feet, and the eaves on each side reach to within about three feet and a half of the ground: below this, and through the whole height at each end, it is open, no part of it being inclosed with a wall. The roof is thatched with palm-leaves, and the floor is covered, some inches deep, with soft hay; over this are laid mats, so that the whole is one cushion, upon which they sit in the day, and sleep in the night. In some houses, however, there is one stool, which is wholly appropriated to the master of the family; besides this, they have no furniture, except a few little blocks of wood, the upper side of which is hollowed into a curve, and which serve them for pillows. The house is, indeed, principally used as a dormitory; for, except it rains, they eat in the open air, under the shade of the next tree. The clothes that they wear in the day serve them for covering in the night; the floor is the common bed of the whole household, and is not divided by any partition. The master of the house and his wife sleep in the middle, next to them the married people, next to them the unmarried women, and next to them, at a little distance, the unmarried men; the servants,

servants, or "toutous," as they are called, sleep in the open air, except it rains, and in that case they come just within the shed. There are, however, houses of another kind, belonging to the chiefs, in which there is some degree of privacy. These are much smaller, and so constructed, as to be carried about from place to place, and set up occasionally, like a tent; they are inclosed on the sides with cocoa-nut leaves, but not so close as to exclude the air, and the chief and his wife sleep in them alone. There are houses also of a much larger size, not built either for the accommodation of a single chief, or a single family; but as common receptacles for all the people of a district. Some of them are 200 feet long, thirty broad, and, under the ridge, twenty feet high; these are built and maintained at the common expence of the district, for the accommodation of which they are intended. Of the food eaten here the greater part is vegetable. Of the only animals, hogs, dogs and poultry, there are by no means plenty. When a chief kills a hog, it is almost equally divided among his dependants; and as they are very numerous, the share of each individual at these feasts, which are not frequent, must necessarily be small. Dogs and fowl fall somewhat more frequently to the share of the common people. Captain Cook could not much commend the flavour of their fowls, but thought a South Sea dog was little inferior to an English lamb; their excellence is probably owing to their being kept up, and fed wholly upon vegetables. The sea affords them a great variety of fish. The smaller fish, when they catch any, are generally eaten raw, as we eat oysters; and nothing that the sea produces comes amiss to them: they are fond of lobsters, crabs, and other shell-fish, which are found upon the coast; and they will eat not only sea insects, but what the seamen call blubbers, though some of them are so tough, that they are obliged to suffer them to become putrid before they can be chewed. Of their vegetables, the principal is the bread-fruit, to procure which costs them no trouble or labour but climbing a tree: the tree which produces it does not, indeed, shoot up spontaneously; but if a man plant ten of them in his life-time, which he may do in about an hour, he will as completely fulfil his duty to his own and future generations, as the native of our less temperate climate can do by ploughing in the cold of winter, and reaping in the summer's heat, as often as these seasons return; even if, after he has procured bread for his present household, he should convert a surplus into money, and lay it up for his children. It is true, indeed, that the bread-fruit is not always in season; but cocoa-nuts, bananas, plantains, and a great variety of other fruits, supply the deficiency. Salt water is the universal sauce, no meal being eaten without it: those who live near the sea have it fetched as it is wanted; those who live at some distance keep it in large bamboos, which are set up in their houses for use. For drink they have in general nothing but water, or the juice of the cocoa-nut; the art of producing liquors that intoxicate, by fermentation, being happily unknown to them: neither have they any narcotic which they chew, as the natives of some other countries do opium, beetle-root, and tobacco. The quantity of food which these people eat at a meal is prodigious; one man will devour two or three fishes as big as a perch, three bread-fruits, each bigger than two fists, fourteen or fifteen plantains or bananas, each of them six or seven inches long, and four or five round, and near a quart of the pounded bread-fruit, which is as substantial as the thickest unbaked custard. The women not only abstain from eating with the men, and of the same victuals, but even have their victuals separately prepared by boys kept for that purpose, who deposit it in a separate shed, and attend them with it at their

meals. After meals, and in the heat of the day, the middle-aged people of the better sort generally sleep: they are, indeed, extremely indolent, so that sleeping and eating are almost their whole employment. Those that are older are less drowsy; and the boys and girls are kept awake by the natural sprightliness and activity of their age. Their amusements are music, dancing, wrestling, and shooting with the bow: they also sometimes vie with each other in throwing a lance. Their only musical instruments are flutes and drums; the flutes are made of a hollow bamboo, about a foot long, and have only two stops, and consequently but four notes. The drum is made of a hollow block of wood, of a cylindrical form, solid at one end, and covered at the other with shark's skin: these they beat not with sticks, but their hands; and they know how to tune two drums of different notes into concord. They have also an expedient to bring the flutes that play together into unison, which is to roll up a leaf so as to slip over the end of the shortest, like our sliding tubes for telescopes, which they move up and down till the purpose is answered, of which they seem to judge by their ear with great nicety. To these instruments they sing; their songs are often extempore; they call every two verses or couplet a song, "palay:" they are generally, though not always, in rhyme; and when pronounced by the natives, they might be discovered to be metre. Their candles are made of the kernels of a kind of oily nut, which they stick one over another upon a skewer that is thrust through the middle of them; the upper one being lighted burns down to the second, and so on to the third, &c. Among other diversions, there is a dance, called "timorodee," which is performed by young girls, whenever eight or ten of them can be collected together, consisting of motions and gestures beyond imagination wanton, in the practice of which they are brought up from their earliest childhood, accompanied by words, which, if it were possible, would more explicitly convey the same ideas. In these dances they keep time with an exactness which is scarcely excelled by the best performers upon the stages of Europe. But the practice which is allowed to the virgin, is prohibited to the married woman. The Otaheiteans are remarkable for cleanliness. Accordingly they wash their whole bodies in running water three times every day. They also wash not only their mouth, but their hands at their meals, almost between every morsel; and their clothes, as well as their persons, are kept without spot or stain. Their principal manufacture is their cloth, which is of three kinds; and it is made of the bark of three different trees: the Chinese paper-mulberry, the bread-fruit tree, and the tree which resembles the wild fig-tree of the West Indies. The colours with which they dye this cloth are principally red and yellow. The red is exceedingly beautiful, and of a brighter and more delicate colour than any we have in Europe. The red colour is produced by the mixture of the juices of two vegetables; neither of which separately has the least tendency to that hue, and is a species of fig called here "Matte," and the other the "Cordia Sebaftina" or "Etou." Of the fig-tree the fruit is used, and of the "Cordia" the leaves. The yellow is made of the bark of the root of the "Morinda citrifolia," called "Nono," by scraping and infusing it in water. The inhabitants of this island have also a method of dyeing yellow with the fruit of the "tamanu:" they have also a preparation with which they dye brown and black. Another considerable manufacture is matting of various kinds; some of which is finer and better in every respect than any we have in Europe: the coarser sort serves them to sleep upon, and the finer to wear in wet weather. They are also very dextrous in making basket and wicker-work; their baskets are of a thousand different patterns, many of them

exceedingly

exceedingly neat; and the making of them is an art that every one practises, both men and women. The women make little bonnets of the cocoa-nut leaf, to shade their faces, at so small an expence of time and trouble, that when the sun is again low in the evening, they throw them away. These bonnets, however, do not cover the head, but consist only of a band that goes round it, and a shade that projects from the forehead. Of the bark of a tree, called "poerou," the "*Hibiscus tiliacus*" of Linnæus, they make ropes and lines, from the thickness of an inch to the size of a small pack-thread: with these they make nets for fishing: of the fibres of the cocoa-nut they make thread, for fastening together the several parts of their canoes, and belts, either round or flat, twisted or plaited; and of the bark of the "erowa," a kind of nettle, which grows in the mountains, and is, therefore, rather scarce, they make the best fishing-lines in the world: with these they hold the strongest and most active fish, such as bonetas and albicores, which would snap our strongest silk lines in a minute, though they are twice as thick. They make also a kind of seine, of a coarse broad graws, the blades of which are like flags; these they twist and tie together in a loose manner, till the net, which is about as wide as a large sack, is from sixty to eighty fathom long: this they haul in shoal smooth water, and its own weight keeps it so close to the ground that scarcely a single fish can escape. In every expedient, indeed, for taking fish, they are exceedingly ingenious; they make harpoons of cane, and point them with hard wood, which in their hands strike fish more effectually than those which are headed with iron can do in our's, setting aside the advantage of our's being fastened to a line, so that the fish is secured if the hook takes place, though it does not mortally wound him. Of fish hooks they have two kinds, admirably adapted in their construction as well to the purpose for which they are designed, as to the materials of which they are made. These are made of mother-of-pearl, or some other hard shell. They have an adze of stone; a chissel, or gouge, of bone, generally that of a man's arm between the wrist and elbow; a rasp of coral; and the skin of a sting-ray, with coral sand, as a file or polisher. This is a complete catalogue of their tools, and with these they build houses, construct canoes, hew stone, and fell, cleave, carve, and polish timber. The canoes, or boats, which are used by the inhabitants of this and the neighbouring islands, may be divided into two general classes; one of which they call *ivahals*, the other *pahies*. (See *Boat*.) In connection with their navigation we may mention their wonderful sagacity in foretelling the weather, at least the quarter from which the wind shall blow at any future time. In their longer voyages, they steer by the sun in the day, and in the night by the stars; all which they distinguish separately by names, and know in what part of the heavens they will appear in any of the months during which they are visible in their horizon; they also know the time of their annual appearing and disappearing with more precision than will easily be believed by an European astronomer. In speaking of time, either past or future, they never used any term but "*Malama*," which signifies moon; of these moons they count 13, and then begin again, so that they have a notion of the solar year: each month, they say, has 29 days, including one in which the moon is not visible. They distinguish them by separate names. Every day is subdivided into twelve parts, each of two hours, of which fix belong to the day and six to the night. In numeration they proceed from 1 to 10, the number of fingers on both hands; and though they have for each number a different name, they generally take hold of their fingers one by one, shifting from one hand to the other till they come to the number

they want to express. In counting from 10, they repeat the name of that number, and add the word *more*; ten and one more, is eleven, &c. When they come to 10 and 10 more, they have a new denomination, as we say a score; and by these scores they count till they get ten of them, when they have a denomination for two hundred; but they did not seem to have any denomination for expressing a greater number. In speaking of distance from place to place, they express it, like the Asiatics, by the time that is required to pass it. Their language is soft and melodious; it abounds with vowels, and captain Cook's company easily learnt to pronounce it: but found it exceedingly difficult to teach them to pronounce a single word of English; probably not only from its abounding in consonants, but from some peculiarity in its structure; for Spanish and Italian words, if ending in a vowel, they pronounced with great facility. Whether it is copious, our navigators were not sufficiently acquainted with it to know; but it is certainly very imperfect, for it is almost totally without inflexion, both of nouns and verbs. Few of the nouns have more than one case, and few of the verbs more than one tense. They have, however, certain affixes, which, though but few in number, are very useful to them. At Otaheite they have few diseases; the natives, however, are afflicted with the erysipelas, and cutaneous eruptions of the scaly kind, very nearly approaching to a leprosy. Some few had ulcers on different parts of their bodies, of a virulent appearance. The method of cure that is chiefly practised by the priests of this island consists chiefly of prayers and ceremonies. Their commerce with the inhabitants of Europe has already entailed upon them that dreadful curse which avenged the inhumanities committed by the Spaniards in America, the venereal disease. There are two places in which their dead are deposited; one a kind of shed where the flesh is suffered to putrify; the other an inclosure, with erections of stone, where the bones are afterwards buried. The sheds are called "*Tapapow*," and the inclosures "*Morais*." The *Morais* are also places of worship. As to their religion, they believe, besides a supreme deity, that there are numerous subordinate deities, or "*Eatuas*," of both sexes; the male are worshipped by the men, and the female by the women; and each have *morais* to which the other sex is not admitted, though they have also *morais* common to both: men perform the priestly office to both sexes, and each sex has its priests; for those who officiate for one sex do not officiate for the other. They also believe the immortality of the soul, at least its existence in a separate state, and that there are two situations of different degrees of happiness, somewhat analogous to our heaven and hell: the superior situation they call "*tavirua l'erai*," the other "*liahoboo*." They do not, however, consider them as places of reward and punishment, but as receptacles for different classes; the first, for their chiefs and principal people; the other for those of inferior rank; for they do not suppose that their actions here in the least influence their future state, or indeed that they come under the cognizance of their deities at all. The character of the priest, or "*tahowa*," is hereditary: the class is numerous, and consists of all ranks of people; the chief, however, is generally the younger brother of a good family, and is respected in a degree next to their kings or emperors. Marriage, in this island, as appeared to us, is nothing more than an agreement between the man and woman, with which the priest has no concern. Where it is contracted, it appears to be pretty well kept, though sometimes the parties separate by mutual consent, and in that case a divorce takes place with as little trouble as the marriage. Their *morai*, or place of worship, they approach with humility and reverence; and when the worshipper brings his

offering to the altar, he always uncovers his body to the waist, and his looks and attitude are such as express a corresponding disposition of mind. It did not appear that these people were guilty of idolatry; at least they do not worship any thing that is the work of their hands, nor any visible part of the creation. Although they cannot be said to live under any regular form of government, yet a subordination is established among them. These orders correspond to king, baron, vassal, and villain. Of the first order there are two in this island, one being the sovereign of each of the peninsulas of which it consists, and he is treated with great respect by all ranks. Those of the next order are lords of one or more of the districts into which each peninsula is divided, and of these there may be about 100 in the whole island. They parcel out their territories to those of the next class, who cultivate, each his part, which he holds under the baron. Those of the lowest class resemble the villains in feudal governments; they do all the laborious work, they cultivate the land under those of the third class, they fetch wood and water, dress the victuals, and catch the fish. If a general attack happens to be made upon the island, every district under the command of the baron, or "Earee," is obliged to furnish its proportion of soldiers for the common defence. The number furnished by all the districts amounted to 6680. Upon such occasions the united force of the whole island is commanded in chief by the king, or "Earee rohie." Their weapons are slings, which they use with great dexterity, pikes headed with the stings of the sting-rays, and clubs, of about six or seven feet long, made of a very hard heavy wood. Thus armed, they are said to fight with great obstinacy, and to give no quarter. Distributive justice, under such a rude government, cannot be administered but very imperfectly; and indeed, considering the facility with which every appetite and passion are gratified, there can be little opposition of interest, and of course crimes are few. There is nothing like money, and this circumstance excludes many crimes. Adultery, however, is sometimes committed, as well as theft. Adultery, in the heat of resentment, is sometimes punished with death, if the offending parties are caught in the act; but in ordinary circumstances the female transgressor seldom suffers more than a beating. Punishment is enforced by no law, nor inflicted by the order of any magistrate. Though this, and the neighbouring islands lie within the tropic of Capricorn, yet the heat is not troublesome, nor did the winds blow constantly from the east. The tides about these islands are, perhaps, as inconsiderable as in any part of the world. A south or south-by-west moon, makes high water in the bay of Matavai, at Otaheite; but the water very seldom rises perpendicularly above ten or twelve inches.

The variation of the compass is $4^{\circ} 46'$ E. On captain Cook's visit to Otaheite in 1773, he was hospitably received; and before his departure, Capt. Furneaux took on board his ship a young man named Omai, a native of Ulitea, where he had some property, of which he had been dispossessed by the people of Bolabola. Omai had a very good understanding, quick parts, and honest principles; his behaviour was such as to render him acceptable to the best company, and his pride led him to avoid the society of persons of inferior rank. His passions were of the same kind with those of other young men, but he had judgment to restrain the indulgence of them in an improper excess. During his stay in England he was introduced to his majesty, for whom he entertained sentiments of respect and gratitude; he was caressed by many of the principal nobility, and did nothing to forfeit the esteem of any one of them; but his principal patrons were the earl of Sandwich, sir Joseph

Banks, and Dr. Solander. Although Omai lived in the midst of amusements during his residence in England, his return to his native country was always in his thoughts, and though he was not impatient to go, he expressed a satisfaction as the time of his return approached. He embarked with Capt. Cook in the Resolution, when she was fitted out for another voyage, loaded with presents from his several friends, and full of gratitude for the kind reception he had experienced among us. On this visit to Otaheite, it was found that though in the years 1767 and 1768, it swarmed with hogs and fowls, these animals were become scarce, and were procured with difficulty. The scarcity of hogs was attributed partly to the number which had been consumed, and carried off by the shipping which had touched there of late years, and partly to the frequent wars between the two kingdoms.

Capt. Cook took pains to ascertain whether, among the religious customs of the natives, human sacrifices were not considered as necessary. He learnt upon the whole, that men for certain crimes were condemned to be sacrificed to the gods, provided that they had not means by which to redeem themselves. By Omai he was informed, that they offer human sacrifices to the Supreme Being. From Cook's information we learn, that the women of Otaheite, and of the Society Isles, have been calumniated by those who represent them, without exception, as ready to grant the last favour to any man that will come up to their price. This, he says, is by no means the case; the favours of married women, and also of the unmarried of the better sort, are obtained with as much difficulty here as in any other country; neither can the charge be understood indiscriminately of the unmarried of the lower class, for many of these admit of no such familiarities. There are, however, prostitutes here as well as in other countries, and perhaps more in proportion. Upon a second visit to this island in May 1774, it was found that a very considerable number of canoes had been constructed in the course of eight months, and that hogs were so plentiful as to afford an ample supply. The number of war canoes raised and equipped by the whole island, amounts to 1720, manned by 68,000 able men, allowing 40 to each canoe, and as these cannot amount to above one-third part of the number of both sexes, children included, the whole island cannot contain less than 204,000 inhabitants. If this number be not over-rated, we may infer from it the richness and fertility of the island, not 40 leagues in circuit, which enable it to support such a number of inhabitants.

The island of Otaheite made formerly but one kingdom; it is not known how long it has been divided. The kings of Tiarrabou are a branch of the family of those of Opoureonu; at present the two are nearly related, and Capt. Cook thinks, that the former is, in some measure, dependent on the latter. Otoo, who was king in 1774, is styled "Euree de hia" of the whole island, and our navigators were informed, that Waheatoua, the king of Tiarrabou, must uncover before him, in the same manner as the meanest of his subjects. Those men who are the principal persons about the king, and form his court, are generally, if not always, his relations. But though the establishment be kingly, there was very little about Otoo, or his court, by which a stranger could distinguish the king from the subject. In his dress there is no pomp; and he submits to the labour of paddling his canoe in common with others that are employed for this purpose. All have free access to him, and converse with him without ceremony; and it is observed, that the chiefs of the island are more loved than feared, and hence it may be concluded, that the government is mild and equitable.

OTAHEITE.

It is a circumstance, which we shall here mention, that the people of Otaheite are extremely fond of red feathers, esteeming them no less valuable than jewels are regarded in Europe; and by a certain arrangement of them, they are used as symbols of the "Eatuas," or divinities, in all their religious ceremonies.

In August 1777, Capt. Cook again visited Otaheite, and took Omai with him. But his conduct was so imprudent, that he soon forfeited the friendship of Otoo, and of every other person of note in the island. He associated with none but vagabonds and strangers, whose sole views were to plunder him; and thus incurred the ill-will of the principal chiefs. The captain and his companions had not been forty-eight hours at anchor in Matavai bay, before they were visited by all their old friends, none of whom came empty-handed; so that they were superabundantly stocked with provisions; nor were they under any apprehensions of exhausting the island, which presented to their notice every mark of the most exuberant plenty. This visit to the island afforded an opportunity of ascertaining whether the offering of human sacrifices constituted a part of the religious institutions of this island. With this view, Capt. Cook attended Otoo to a morai at one of their public solemnities. He has particularly described the manner in which they were conducted. The unhappy victim, offered to the object of their worship on this occasion, was a middle-aged man, who was one of the lowest class of the people, and he had been selected, not on account of any particular crime, committed by him, meriting death. In general, however, such guilty persons are chosen for their sacrifices; or else, common low fellows, who stroll about from place to place, and from island to island, without having any fixed abode, or any visible way of getting an honest livelihood. This person appeared to have been privately knocked on the head with a stone. Those who are devoted to suffer, in order to perform this bloody act of worship, are never apprised of their fate, till the blow is given that terminates their existence. Whenever any one of the great chiefs thinks a human sacrifice necessary on any particular emergency, he pitches upon the victim. Some of his trusty servants are then sent, who fall upon him suddenly, and put him to death with a club, or by stoning him. The king is next acquainted with it, whose presence at the solemnities that follow is absolutely necessary. The solemnity itself is called "Poore Eree," or chief's prayer; and the victim, who is offered up, "Taataboo," or consecrated man. The morai, which is a place of worship, sacrifice, and burial, where the sacrifice was now offered, is that where the supreme chief of the whole island is always buried, and is appropriated to his family and some of the principal people; it differs little from the common ones, except in extent. Its principal part is a large, oblong pile of stones, lying loosely upon each other, about twelve or fourteen feet high, contracted towards the top, with a square area on each side, loosely paved with pebble stones, under which the bones of the chiefs are buried. At a little distance from the end nearest the sea is the place where the sacrifices are offered, which, for a considerable extent, is also loosely paved. Here is a very large scaffold, on which the offerings of fruits and other vegetables are laid. But the animals are deposited on a smaller one, and the human sacrifices are buried under different parts of the pavement. There are several other relics which ignorant superstition has scattered about this place. But one place, more particular than the rest, is a heap of stones, at the end of the large scaffold, before which the human sacrifice was offered; and on a kind of platform at one side are laid the skulls of all the human sacrifices, which are taken up after

they have been several months under ground. It cannot less than be regretted, that a practice so horrid, and such bloody rites of worship should prevail, as is probably the case, through all the widely extended islands of the Pacific ocean. There is reason also for believing, that there was a time when these deluded people were cannibals. Human sacrifices are not the only barbarous custom that is still prevalent among this benevolent, humane people. For, besides cutting out the jaw-bones of their enemies slain in battle, which they carry about as trophies, they, in some measure, offer their bodies as a sacrifice to the "Eatooa." Soon after a battle in which they have been victors, they collect all the dead that have fallen into their hands, and bring them to the morai, where, with much ceremony, they dig a hole, and bury them all in it, as so many offerings to the gods; but their skulls are never after taken up.

Having settled Omai in the island of Huaheine, and having provided a comfortable habitation with suitable accommodations for him, our navigators took their leave of him on the 2d of November 1777; but in parting with Capt. Cook his feelings were much agitated, and he wept all the time in going ashore. Whatever faults, says Capt. Cook, belonged to Omai's character, they were more than overbalanced by his great good-nature and docile disposition. Otaheite lies in S. lat. $17^{\circ} 30'$ to $17^{\circ} 48'$. W. long. $149^{\circ} 15'$ to 150° . Matavai point lies in S. lat. $17^{\circ} 29\frac{1}{2}'$. E. long. $210^{\circ} 22' 28''$. Variation of the compass $5^{\circ} 34'$ E. Dip of the needle $29^{\circ} 12'$. Mr. Anderson has furnished several particulars of information with regard to Otaheite, which form a distinct chapter in the second volume of Cook's third voyage. Extended as this article is, we shall here select a few of them. There is, he says, scarcely a spot in the universe, that affords a more luxuriant prospect than the S.E. part of Otaheite. The hills are high and steep, and in many places craggy. But they are covered to the very summits with trees and shrubs, so that the observer would almost imagine, that the rocks had the property of producing and supporting their verdant clothing. The flat land that bounds these hills towards the sea, and the interjacent vallies, teem with various productions which grow with the most exuberant vigour. Nature has been no less liberal in distributing rivulets, which are found in every valley, and which, as they approach the sea, divide into two or three branches, fertilizing the flat lands through which they run. The habitations of the natives are scattered without order upon these flats, and many of them appearing toward the shore, present a delightful scene to the ships in the harbour. It is owing to the fertility of the country, combined with the mildness and serenity of the climate, that the natives are so careless in their cultivation, so that in many places the smallest traces of it cannot be observed. The cloth plant, which is raised by seeds brought from the mountains, and the "ava," or intoxicating pepper, which they defend from the sun when very young, by covering them with leaves of the bread-fruit tree, are almost the only things to which they seem to pay any attention; and these they keep very clean. Notwithstanding the fertility of the island, a famine frequently happens, in which, it is said, many perish. Of animal food little falls to the share of the lower class of people; and then it is either fish, sea-eggs, or other marine productions; for they seldom, or ever, eat pork. It is also among the better sort that the "ava" is chiefly used. The women not only eat by themselves, but are excluded from a share in most of the better sorts of food.

One of the greatest natural curiosities of the country is a pond or lake of fresh water, at the top of one of the highest mountains, remarkable for its depth, and for its eels

of an enormous size. The language of Otaheite, though radically the same with that of New Zealand and the Friendly islands, is destitute of that guttural pronunciation, and of some consonants, with which these latter dialects abound. Like the manners of the inhabitants, the language has thus become soft and soothing. It abounds with beautiful and figurative expressions, which would put it upon a level, if they were known and understood, with many of those languages that are most esteemed for their warm and bold images.

In forming connections with the females, they have customs that are deemed capricious and licentious. If a young man and woman, from mutual choice, cohabit, the man gives the father of the girl such things as are necessary in common life, as hogs, cloth, or canoes, in proportion to the time they are together; and if he thinks he has not been sufficiently paid for his daughter, he makes no scruple of forcing her to leave her friend, and to cohabit with another person, who may be more liberal. The man is always at liberty to make a new choice, but should his comfort become pregnant, he may kill the child; and after that continue his connection with the mother, or leave her. It is thought no crime in the man to join a more youthful partner to his first wife, and to live with both. But the custom of changing their connections is more common, and is spoken of with great indifference. The "Erreoes" are only those of the better sort, who from being able to purchase a succession of fresh connections, are constantly roaming about and changing. So agreeable is this licentious plan of life to their disposition, that the most beautiful of both sexes thus spend their youthful days, habituated to the practice of enormities that would disgrace the most savage tribes; but are peculiarly shocking amongst a people, whose general character, in other respects, has evident traces of the prevalence of humane and tender feelings. When an "Erreoe" woman is delivered of a child, a piece of cloth, dipped in water, is applied to the mouth and nose, which suffocates it. The women are frequently treated with harshness and even brutality. Nothing is more common than to see the men beat them without mercy. Cutting or incising the foreskin (not circumcision) is a practice adopted among them from a notion of cleanliness; and they also apply reproachful appellations to those who do not observe that custom.

As to their religious system, it is extensive and in many instances singular; but few of the common people are acquainted with it; the knowledge of it being confined to their priests. They do not seem to pay respect to one god, as possessing pre-eminence, but believe in a plurality of divinities, who are all very powerful. Their assiduity in serving their gods is very conspicuous. Their prayers are very frequent, which they chant, much after the manner of the songs in their festive entertainments. The women, as in other cases, are obliged to shew their inferiority in religious observances; for they are required to uncover themselves in passing the morai; or take a considerable circuit in avoiding them. They are apprehensive of the power of some inauspicious being to hurt them. They say, that "Etee" is an evil spirit, who sometimes does them mischief; and to whom, as well as to their god, they make offerings. But the mischiefs they apprehend from any superior invisible beings are confined to things merely temporal. Believing the soul to be both immaterial and immortal, they say, that it flutters about the lips during the pangs of death, and that then it ascends, and mixes with, or as they express it, is eaten by the deity. In this state it remains for some time; and then departs to a certain place, destined for the reception of the souls of men, where it exists in eternal

night, or, as they sometimes say, in twilight, or dawn. They have no idea of any permanent punishment after death for crimes committed upon earth; for the souls of good and of bad men are eaten indiscriminately by God. But they consider this coalition with the deity as a kind of purification, necessary to be undergone, before they enter a state of bliss. For, according to their doctrine, if a man refrain from all connection with women some months before death, he passes immediately into his eternal mansion, without such a previous union. Some of their notions about the deity are extravagantly absurd; conceiving that he is subject to be destroyed by spirits to whom he has given existence, and that afterwards he has the power of re-creating himself. They maintain, among other singularities, that not only all other animals, but trees, fruit, and even stones, have souls, which at death, on being consumed or broken, ascend to the divinity, with whom they first mix, and afterwards pass into the mansion allotted for each. They believe that sudden death, and all other accidents, are effected by the immediate action of some divinity. They have confidence in dreams, which they suppose to be communications either from their god, or from the spirits of their departed friends, enabling those favoured with them to foretell future events; but this kind of knowledge is confined to particular people. Omai pretended to have this gift. They have traditions concerning the creation, which, as we may naturally imagine, are complex, and clouded with obscurity. They have all many legends, both religious and historical.

The boundaries of the several districts, into which Otaheite is divided, are, generally, either rivulets, or low hills, which in many places jet out into the sea. But the subdivisions into particular property are marked by large stones, which have remained from one generation to another. The removal of any of these gives rise to quarrels, which are decided by arms; each party bringing his friends into the field. But if any one complain to the "Eree de hai," he terminates the difference amicably.

The number of inhabitants in both peninsulas of Otaheite is stated, in the "Missionary Voyage," to be about 50,000; and this estimate, though lower than that of captain Cook, is thought greatly to exceed the population. For other particulars respecting the disposition and character, the manners and customs, the occupations and amusements of the Otaheiteans, as they do not materially differ from those of captain Cook and his associates, we refer to the appendix of the Missionary Voyage, 4to. Lond. 1799.

OTAKOOTIA, or WEENOOAETTE, signifying little island, an island of the South Pacific ocean, about three miles in circuit; discovered by captain Cook in the year 1777. The beach, within the reef, is composed of a white coral sand; above which, the land within does not rise above six or seven feet, and is covered with a light reddish soil; but is entirely destitute of water. The only common trees found there were cocoa-palms, of which there were several clusters, and vast numbers of the "wharra." A sort of bind-weed covers the vacant spaces; except in some places, where was found a considerable quantity of treacle-mustard, a species of spurge, with a few other small plants, and the "morinda citrifolia," the fruit of which is eaten by the natives of Otaheite in times of scarcity. The only bird seen among the trees was a beautiful cuckoo, of a chestnut-brown, variegated with black. But upon the shore were some egg-birds, a small sort of curlew, blue and white herons, and great numbers of noddies. Here was found a lizard, of a most forbidding aspect, though small, running up a tree; and many of another sort were seen.

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The banks toward the sea were frequented by an infinite number of, a fort of moth, elegantly speckled with red, black, and white. There were also several other sorts of moths, as well as some pretty butterflies, and a few other insects. Although no fixed inhabitants were found on this island, indubitable marks remained of its being, at least, occasionally frequented. Some huts were found; and also several large stones, erected, like monuments, under the shade of some trees; and several spaces inclosed with smaller ones; where, probably, the dead had been buried; and, in one place, a great many cockle-shells of a particular sort, finely grooved, and larger than the fist were to be seen; from which it was reasonable to conjecture, that the island had been visited by persons who feed, partly, upon shell-fish; about three or four leagues from Wateoo. S. lat. $19^{\circ} 15'$. E. long. $201^{\circ} 37'$. Cook's Third Voyage, vol. i.

OTALGIA, from *ous*, the ear, and *algos*, pain, a pain in the ear.

OTANGURA, in *Geography*, a town of Bengal; 16 miles S.S.W. of Tomar.

OTARDIS. See BUSTARD.

OTCHAKOV, in *Geography*, a town of Russia, in the government of Ekaterinoflav, at the mouth of the Dnieper, on the Black sea. This town has been of considerable importance to the Turks, as a harbour for their galleys against the Corsairs; and being always fortified and garrisoned, it served them to act against the Russians. The colony of Milesians, by whom it was founded, called it "Olbia." In 1737 it was besieged by the Russians under count Munich, who carried it by assault on the third day after opening the trenches. In the following year the Russians evacuated it, after having demolished the works. In 1789 it was again besieged by the Russians under prince Potemkin, and taken by storm. On this occasion, 6000 Turks were killed and 300 made prisoners; and the Russians lost about 4000 men. It was formerly a place of considerable trade, but since the establishment of Odessa, its trade has declined: 40 miles W. of Cherson. N. lat. $46^{\circ} 44'$. E. long. $31^{\circ} 34'$.

OTCHIER BAY, a bay on the N. coast of South America, W. of the river Urano and E. of cape Caldero; 10 miles W. of Cumana.

OTCHI-HOTUN, a town of Asia; 150 miles N.E. of Cashgar. N. lat. $40^{\circ} 46'$. E. long. $84^{\circ} 14'$.

OTEAVANOAA HARBOUR, a bay on the S.W. coast of the island of Bolabola. This is one of the most capacious harbours captain Cook ever met with.

OTENCHYTES, from *otos*, the genitive of *ous*, the ear, and *εγχυω*, to pour in, a syringe for the ear.

OTHER, in *Biography*, a celebrated Norwegian, who resided some time at the court of Alfred the Great. He was a man of great consideration in his own country, though his whole riches consisted of no more than twenty head of cattle, twenty sheep, and as many swine, and being possessed of an enterprising spirit, he undertook a voyage of discovery towards the White sea; and another towards Sweden, on the shores of the Baltic. Alfred, who had been at Rome, where he probably collected the materials for his *Geography*, having caused the Ormesta or Hormesta of Orosius to be translated into the Anglo-Saxon, introduced into it the relations of Other, and of Wulfstan, a Dane, who, perhaps, became acquainted with Other in the course of his travels, or resided with him in England. Alfred's account of the voyages of Other and Wulfstan is said to be exceedingly valuable, as containing the best in-

formation with regard to the geography of the northern regions in the ninth century. Gen. Biog.

OTHERA, in *Botany*, a genus of Thunberg's, very nearly allied to *Orixa*. Of its etymology we are unable to form a conjecture. Thunb. Nov. Gen. 56. Japon. 4. Willd. Sp. Pl. v. 1. 671. Juss. 288.—Class and order, *Tetrandria Monogynia*. Nat. Ord. *Berberides*, Juss.

Gen. Ch. *Cal.* Perianth inferior, of one leaf, permanent, cloven into four ovate segments. *Cor.* Petals four, ovate, blunt. *Stam.* Filaments four, inserted at the very base of the petals, opposite to them, and about half their length; anthers twin, with four furrows. *Pist.* Germen superior, smooth; style none; stigma sessile. *Peric.* unknown, probably a capsule.

Eff. Ch. Petals four, ovate, flat. Calyx four-cleft. Stigma sessile. Capsule?

1. *O. japonica*. Linn. Syst. Veg. ed. 14. 158. Thunb. Japon. 61.—Native of Japan, where it is called *Mukade Ko*, that is *Millepeda*. Stem shrubby, with round, striated, purple branches. Leaves alternate, stalked, ovate, obtuse, undivided, smooth, coriaceous, spreading. Flowers axillary, clustered, white.

OTHMAN, in *Biography*, the third Saracen caliph, was one of the companions and secretary of Mahomer. On the death of Omar, in the year 634, the choice of a successor was left to six electors, who concurred in the nomination of Othman, after he had solemnly promised to govern according to the rules of the Koran. He was far advanced in life when he came to the throne, esteemed for his piety and integrity, and distinguished by the same simplicity of manners which had characterised his two predecessors. His first public act was to send a body of troops to complete the reduction of Hamadan, while another body entered Persia, whence they totally expelled the unfortunate prince Yefsejerd. The caliph shewed an unjustifiable partiality for his own relations, by appointing his foster-brother Abdallah-ebn-Said to supersede the renowned Amru in the government of Egypt, which he had conquered. This measure was as disagreeable to the Arabians as to the Egyptians, and its consequence was a revolt of the Alexandrians, who surrendered their city to the Greek emperor. Othman, thus made sensible of his fault, restored the government to Amru, who recovered Alexandria, though not without loss and difficulty. Moawiyah, about the same time, took the isle of Cyprus, and the important Syrian sea-port of Aradus. The isle of Rhodes afterwards fell under his power. Another Moslem army reduced all that part of Khorasan which had not then submitted to the Mahometan yoke. From Upper Egypt Abdallah-ebn-Said made an incursion into Nubia, the Christian sovereign of which country he reduced to beg for peace, on condition of becoming his tributary. While the Moslem empire was thus extending on all sides under the auspices of Othman, the caliph himself was in danger of losing the affection of his subjects, by the weakness of his measures. Several charges were exhibited against him, of which one was his lavish donations to his favourites out of the public treasury. Othman told the assembled people, that money in the treasury was a sacred deposit, appropriated to the service of God, and that he, as the successor of the apostle of God, had a right to dispose of it according to his own pleasure. An aged companion of the prophet ventured to declare his disapprobation of what he had heard; upon which he was so maltreated by the partizans of Othman, that he was left for dead. This cruel and unjust act so inflamed the passions of the people, that they insisted upon Othman's abdication. He again saw his error, and promised a redress of grievances; but his apparent

parent condescension only increased their violence. At length Ali, the son-in-law and nephew of Mahomet, who had a considerable party among the insurgents, was induced to use his influence for the restoration of tranquillity, which was effected by his joining the caliph in a promise to remove the causes of complaint. Intrigues were, however, formed to depose him; and by the circulation of some wicked calumnies, Mahomet became again his enemy, and with his party invested the caliph's palace, denouncing vengeance against his person. Othman requested aid from Ali, who sent his sons, Hassan and Hosein, to defend the gates of the palace. This they faithfully performed for several days, till at length, either for want of water, or of a hearty inclination, they withdrew, and left the caliph to the mercy of his enemies. But mercy had fled from their hearts, and Othman, placing the Koran in his bosom, waited to receive his assassins. Mahomet seized him by the beard, and plunged his sword into his breast. Others pierced his body in different parts, and he expired under multiplied wounds. For three days his corpse lay unburied, and exposed to the insults of the multitude; and at length it was without ceremony thrown into a hole. This happened in the year 655, and in the twelfth year of the caliph's reign. He was a man of a majestic figure, and venerable aspect, pure in his morals, but did not possess a mind at all adapted to the duties of his station. Univer. Hist. Gibbon.

OTHMAN, or OSMAN, the founder of the Ottoman dynasty, was the son of Orthogrul, a Turkman or Oguzian chieftain, who had entered into the service of Aladin, sultan of Iconium, and had established himself with his tribe at Surgut, on the banks of the Sangar. Aladin had made him lieutenant-general; and after the death of that sultan, great dissensions arose among his officers, who at length agreed to join their forces, and make conquests on the Greek empire in Lesser Asia. When the division of the conquered countries was made, Bithynia fell to the lot of Othman. On the 27th of July 1299, having forced the slightly guarded passes of mount Olympus, he first invaded the territory of Nicomedia; and "the singular accuracy of the date," says the historian, "seems to disclose some foresight of the rapid and destructive growth of the monster." The annals of the twenty-seven years of his reign would exhibit a repetition of the same inroads; and his hereditary troops were multiplied in each campaign, by the accession of captives and volunteers. Instead of retreating to the hills, he maintained the most useful and defensible posts, fortified the towns and castles, which he had first pillaged, and renounced the pastoral life for the baths and palaces of his infant capital." In the course of many years of active service, he made himself master of the whole of Bithynia; and though he was repulsed in his attempts upon Nicomedia and Prusa, he awed those cities by the construction of strong forts in their neighbourhood. At length his son ORCHAN gained possession of Prusa; but the welcome news of this important conquest did not arrive till Othman was almost insensible to glory, by the severe pressure of old age and infirmities. He died in 1326, in the 69th year of his age, and 27th of his reign, reckoning from his invasion of Bithynia. This was the commencement of the Turkish empire, which, from his name, has taken the appellation of the Ottoman Porte. The glory of Othman is chiefly founded on that of his descendants; but the Turks have transcribed or composed a royal testament of his last counsels of justice and moderation. Univer. Hist. Gibbon, vol. xi.

OTHO, M. SALVIUS, in *Biography*, a Roman emperor, was descended from a consular family; and in the beginning of the reign of Nero, or about the year 55, he was distin-

guished as a young man of graceful person but licentious manners, and even well fitted as a companion to the emperor in his debaucheries. While in possession of imperial favour he contracted an acquaintance with the beautiful Poppæa Sabina, the wife of Rufus Crispinus, which was followed by a divorce from her husband and a marriage with her lover. Otho, from whatever motive, was continually extolling to the emperor, in the most rapturous terms, the happiness which Poppæa afforded him. Nero, inflamed by these representations, desired that he might have an interview with the lady, who employed her charms so effectually, that he was entirely captivated. He carried her off from her husband, and when Poppæa, to secure his affections by jealousy, expressed a great fondness for Otho, that Nero forbid him his palace, and would probably have gone the length of putting him to death, had not Otho's friend, Seneca, suggested his appointment to the government of Lusitania, by way of an honourable exile. In this situation he conducted himself with great credit, acquired a new character, and was distinguished for the uprightness and gravity of his administration. He had resided ten years in his province, when, on the declaration of Galba against the tyranny of Nero A. D. 68, he was the first person in office who joined his party, probably with a view to the succession of the empire by means of the adoption of Galba. When this emperor was seated on the throne such a measure was proposed to him by Vinus, whose daughter Otho was engaged to marry, but Galba was not of the same opinion, he preferred the mature and rigid virtue of Piso as the subject he chose to adopt. Otho resented this determination, and he resolved to make himself master of the treasures of the empire, and having set his mind upon obtaining the sovereign authority, he prepared the way for his elevation by the extraordinary attention which he paid to gain the affections of the soldiery, in which he succeeded beyond any man of his time. When his plans were matured, he fixed on two common soldiers to spread disaffection through the legions quartered in Rome, and at a proper moment Otho appeared in a public place, and was saluted emperor by a small party of the prætorians, consisting only of twenty-three. He was at first intimidated at the smallness of the number, and would have retreated, but the soldiers, placing him in a chair, carried him with swords drawn to the camp, where the whole body joined in the salutation. The revolt spread to the other troops, and Galba advancing to the forum, was abandoned by his friends and basely murdered. (See GALBA.) Otho was immediately recognized as lawful emperor by that very senate which had raised and supported Galba, and he began his reign in January A. D. 69. One of his first acts was to admit Marius Celsus, who had been the designated consul under Galba, among his confidential friends. He sacrificed to the public hatred Tigellinus, the hated minister of Nero; but on the memory of that bloody emperor he shewed a disposition to confer honours. He felt himself in a situation of great danger, and was glad to cultivate popularity with all classes of the people, for a storm appeared which threatened to subvert his throne. The legions quartered in Germany, which were always the strength of the Roman armies, had thrown off their allegiance to Galba, and had declared Vitellius emperor, and such was their impatience to give a master to the Roman world, that they had set out on their march for Rome before they received the news of the death of Galba. They were joined by the troops in Gaul; and several places in Italy declared for Vitellius, after his lieutenant Cæcina, at the head of the first division, had crossed the Alps. Rome was now in the greatest consternation at the prospect of the approaching civil war.

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The two chiefs, Otho and Vitellius, reciprocally employed assassins to remove their rivals, but at the same time the family of Vitellius remained at Rome in safety, as a pledge for the security of that of Otho, should fortune throw it in the power of the former. In the midst of the alarms excited by this state of affairs, a sedition of the prætorians had nearly produced a terrible destruction at Rome. They seized upon their arms, murdered some of their officers, and conceiving that the senate was planning treason against their emperor, resolved upon the extermination of the whole order. Otho was on that evening giving an entertainment to a numerous company of persons of high distinction of both sexes, who were struck with the utmost terror, suspecting that it might have been a plot contrived by the emperor for their destruction. He soon, however, convinced them that their fears did him injustice, and sent them home by private ways, at the time that the soldiery were breaking into the palace. He had now to contrive means to appease the insurgents, which he did effectually by donatives well applied. Otho resolved to meet the approaching danger, and quitting Rome at the head of his troops, he went to defend the passage of the Po. Every thing seemed to be unfavourable to the cause of Otho, though he himself is described by Tacitus, as having left all his luxurious indulgences behind him, and marching on foot, clad in steel, and covered with dust. The chiefs of the senate were grown old and impotent; the rich men of Rome were indolent and slothful; the knights had long been dissolved in ease and luxury, and the cohorts themselves were relaxed from the military discipline of their ancestors. Otho it is true was powerful, with regard to numbers; but his men, being little used to war, could not be relied upon. He seemed, by his behaviour, to be sensible of the disproportion of the forces, and is said to have been tortured with frightful dreams, and the most dismal apprehensions. With this temper he became impatient for an engagement, contrary to the opinion of his most prudent officers, who depended on ultimate success chiefly from foreign armies attached to their party. They were, however, obliged to submit to the emperor's determination, which was supported by his flatterers, by whom also he was persuaded to the inglorious, and, as it proved, the prejudicial step of retiring from the army with a part of the guards, before the commencement of the action. Between Cremona and Bedriacum the fatal battle was fought. The superior discipline of the legions of Vitellius turned the scale of victory. Otho's army fled in the utmost confusion to Bedriacum. Otho received the fatal news at Brixellum, whither he had retired, and his first thought was to destroy himself, as the only means of freeing himself from his cares, and his country from the dire calamities of a civil war. The soldiers flocked round him, beseeching him to live, and to confide in their fidelity and valour for retrieving his affairs. They embraced his knees, kissed his hand, and gave every demonstration of their adherence and attachment. A common soldier, seeing him immovable, drew his sword, and exclaiming, "From this Cæsar, judge of our fidelity, for there is not a man among us who would not do as much to serve you," plunged it into his own body, and fell dead at his feet. "No more such brave men," cried Otho, "shall lose their lives on my account." He accordingly mounted the tribunal, and made a most pathetic speech to his soldiers, in which he gave reasons for declining the contest. "I can never," said he, "so much advance the interests of my country by war and blood, as by sacrificing myself for its peace. Others have purchased real fame by good government, let it be my glory to leave an empire, rather than, by my ambition, to weaken or destroy it." He expressed the greatest satisfaction and gratitude for the attachment he had met with,

and then announced his final decision. He earnestly exhorted all who adhered to him to submit in time to the conqueror, that they might deserve and obtain his clemency. He took measures to expedite their departure, and divided his jewels and money among his friends. Then retiring to a private chamber, he wrote consolatory letters to his sister, and to a lady whom he designed to marry. Hearing a tumult among the soldiers, he went out and quieted them, and returning to his chamber, he drank a draught of cold water, tried the points of two daggers, and placed the sharpest under his pillow. He lay down in perfect tranquillity, and passed some hours in sleep. At day-break Otho gave himself the mortal stroke, and expired in the arms of those who entered on hearing his groans. The soldiers assembled at the mournful news, and with bitter lamentations carried his body to the funeral pyre. Several slew themselves as a sacrifice to his manes, and many in the neighbouring quarters, when they heard of the event, fell by mutual wounds. Otho died at the age of thirty-seven, after a reign of three months. There is something in the conclusion of this prince's reign, that almost atones for the methods which he adopted to acquire dominion. The faults of his life were, in the general opinion, obliterated by the glory of his death.

OTHO I., surnamed the *Great*, emperor of Germany, was the son of Henry, of the house of Saxony, and inherited from his father, the duchy of Saxony, Westphalia, Thuringia, and several other districts on the Weser and Elbe. After the death of Henry, in 936, Otho was elected emperor, and crowned at Aix-la-Chapelle in the following year. Just and upright in his administration, he ruled for a considerable time in tranquillity, till the disturbances of those unsettled times obliged him to draw the sword. His arms were first directed against the Hungarians, who made an irruption into Franconia and Saxony, and laid waste the country. Otho defeated them with great slaughter: he was next engaged in a long war with Boleslaus, duke of Bohemia, whom he at length reduced to submission. After this Otho was called upon to interpose in a dispute between Everhard, duke of Franconia, and Henry, duke of Brunswick: he caused the former, with his principal adherents, to be tried, and condemned them to the singular punishment of each carrying a dog upon his shoulders from the place of his dwelling to Magdeburg. Henry, who was Otho's brother, afterwards made a league, with Everhard and the duke of Austria, against the emperor, which brought on a battle, in which the latter was victorious. He was equally successful on the other side of the Rhine, where he made himself master of Lorraine, and other districts on the western banks of the river, and laid the foundation of the palatinate of the Rhine. Lewis IV. of France married the sister of Otho to strengthen himself against his disaffected subjects, an alliance, however, that did not prevent the emperor from entering France in 942, and expelling Lewis from Champagne. After this he took part with Lewis against Hugh the Great, father of Hugh Capet, and in conjunction with him took Rheims in 945. In 949, in consequence of the massacre, by the Danes, of the Saxon colony settled in Sleswick, Otho marched with an army into Jutland, where he had a battle with king Harold. The result was a treaty, by which the emperor was to keep a garrison at Sleswick, and Harold was to permit the Christian religion to be preached in his dominions. In 955 the Hungarians entered Germany in vast numbers, and penetrating as far as Swabia, laid siege to Augsburg. Otho immediately assembled the force of the empire to oppose them, and after an obstinate engagement defeated them with great slaughter. His reputation at this period procured him two distant embassies of friendship, one from Abderame, the Moorish

Moorish king of Cordova, the other from Helen, queen of the Russians, who requested him to send missionaries in order to instruct her subjects in the doctrines of Christianity. The oppressions of Berenger in Italy continuing, Otho sent his son Ludolf to check his tyranny, who defeated him in several engagements, but was himself cut off by a premature death. Otho himself, solicited by the pope to come to the deliverance of the church, and promised the imperial crown as a recompence, in 960 marched into Italy at the head of a powerful army. Berenger did not wait for his approach; and at Milan he was crowned king of Italy. In the next spring he advanced to Rome, where he received the imperial crown from the hands of John XII., and from this era, according to Gibbon, "two maxims of public jurisprudence were introduced by force and ratified by time. 1. That the prince who was selected in the German diet, acquired from that instant the subject kingdoms of Italy and Rome: but 2. That he might not legally assume the titles of emperor and Augustus, till he had received the crown from the hands of the Roman pontiff." Otho bestowed splendid gifts upon the church of St. Peter, and restored to the papal see the domains that had been wrested from it, but at the same time he imposed an oath upon the senate and people of Rome, that they would never elect a pope without his consent. The pope, finding that he had procured a master in an ally, invited, as soon as Otho had withdrawn his army from Rome, Adelbert, the son of Berenger, and entered into a treaty with him for the expulsion of the Germans. The emperor thereupon convoked a council, which deposed John, on the charge of his scandalous life, and elected a new pope under the name of Leo VIII. This pope, in gratitude for his elevation, confirmed to Otho and his successors the prerogative granted to Charlemagne, of nominating popes and conferring investiture on bishops. On the death of John, which happened soon after, his adherents chose Benedict V. in his stead. The emperor returning to Rome, deposed him and replaced Leo on the throne, and then went back to Germany. On the death of Leo, John XIII. was chosen, in compliance with the recommendation of Otho, but the Romans soon after imprisoned him, and renounced their allegiance to the emperor. Upon this he recrossed the Alps in 967, visited Ravenna, and other Italian cities, and caused his son Otho to be crowned at Rome, as his partner in the empire. At Capua he received an embassy from the Greek emperor, Nicephorus Phocas, who proposed a renewal of the alliance between the two empires, and requested his aid to expel the Saracens from Calabria. Otho gave a favourable reply to the ambassadors, and made overtures of marriage between his son and Theophano, step-daughter of the Greek emperor. The ambassadors whom he sent to Constantinople for the purpose of regulating the nuptials, were treacherously massacred, which violation of the laws of nations Otho revenged, by sending an army to ravage the Greek possessions in Calabria. After the death of Nicephorus, an agreement was entered into with his successor, John Zimices, and the marriage was consummated. Not long after, in the enjoyment of peace and prosperity, this emperor died, of an apoplectic disorder, in the year 972, after a long and active reign, during which he gave some extraordinary proofs of piety, courage, and generosity, on account of which he justly acquired the epithet of Great. His consort Alix retired into a convent immediately after his decease; and his remains were interred, with due solemnity, in the cathedral church of Magdebourg, where his tomb is said to be still distinguished by a Latin inscription. Univer. Hist. Gibbon.

OTHO II., emperor of Germany, son of the preceding, succeeded his father to the imperial crown, though opposed

by Henry, duke of Bavaria, who was proclaimed emperor at Ratisbon, but who was soon obliged to renounce his title and also relinquish his duchy. Otho next found himself involved in a troublesome war with Lotharius, king of France; at first he attempted to appease the French king by some important concessions, but this proving unsuccessful, he assembled an army of 60,000 men, made an irruption into the enemy's country, and committed such dreadful ravages, that he quickly had peace on his own terms. In this expedition, however, he was exposed to imminent danger by an inundation of the river Aisne, which destroyed a considerable part of his army. After devoting some time to the arrangement of his affairs in Germany, he led a numerous body of forces into Italy, in order to punish a revolt of the Romans, and to recover Apulia and Calabria, which had been recently taken by the Greeks and Saracens. He accordingly entered Rome without opposition, and soon after hazarded a battle with the enemy, but his army was defeated, and he himself was reduced to the necessity of committing himself to the mercy of the waves in a solitary vessel, having first stripped himself of his imperial robes. This ship was taken by corsairs, to whom he promised a large sum for a ransom, and while they were hesitating, he took the opportunity of throwing himself into the sea and swimming ashore at Rosani, where the empress then was. Soon after this event he renewed the war with vigour, and his exertions were attended with such signal success, that the Saracens in Italy were utterly exterminated. He then chastised the pusillanimous troops who had deserted him in a former engagement; gave up the town of Beneventum to military execution, for having furnished his enemies with provisions; and revenged himself for the defection of the Romans, by causing many of the principal citizens to be massacred at a banquet. This savage act obtained for him the title of the "Sanguinary." After this he marched into Lombardy, and held an assembly of the states of Italy and Germany at Verona, in which he caused his young son Otho to be recognized as heir of the empire. He then returned to Rome, where he fell ill, and died in the year 983, having sat upon the throne between ten and eleven years. His death has been differently accounted for; some say it was occasioned by the wound of a poisoned javelin, received in his war with the Greeks, and others assert that his death was hastened by the imprudent behaviour of his empress Theophania, who had publicly exulted in the victories of her countrymen, though it was obtained over her husband. His own opinion of the reliance to be placed on his Italian subjects, was shewn by a law, in which he forbade their evidence to be taken even on oath. Univer. Hist. Gibbon.

OTHO III., emperor of Germany, son of the preceding, was twelve years of age when he succeeded to the throne, on which account he obtained the surname of the "Infant," but when this appellation was no longer applicable, he acquired the epithet of "Rufus." Henry, duke of Bavaria, nephew of Otho I., took possession of the person of the young prince, under pretence of the right of guardianship, but a considerable number of the German princes assembling, delivered him from the duke's custody, and caused him to be proclaimed emperor with the usual solemnities. While the other parts of his dominions submitted to his authority, the city of Rome shook off the German yoke in favour of Crescentius, governor and titular consul of that city. The commencement of this reign was disturbed by hostile incursions of the Danes and Sclavonians, but the imperial arms were at length decidedly victorious. About this time a furious contest began between Charles, duke of

of Lorrain, and Hugh Capet, which terminated in the captivity of the former, and the exaltation of his rival to the crown of France. In 996 he crossed the Alps, reduced Milan, where he received the Lombard crown, and proceeding to Rome, filled the pontifical chair, which was become vacant, with a relation of his own, by the name of Gregory V., by whom, in return, he was crowned emperor. He pardoned Crescentius, quieted the disturbances at Capua and Benevento, and then revisited the Lombard cities on his return to Germany. On his arrival at Modena, he gave a striking proof of what was denominated, in those days, a love of justice, upon the empress Mary, daughter of the king of Arragon, who, having been repulsed in her criminal advances to the count of that place falsely accused him of an attempt upon her honour. Otho, paying credit to the charge, had put the count to death, but his widow demanding justice, having proved the innocence of her husband, Mary was ordered to be burnt alive, and the emperor devoted a large sum of money to be paid for the benefit of the widow. Such is the story of the time, which is entirely discredited by many of the best historians; and others, who seem to concur in admitting the general fact, represent the empress as having only been disgraced, and her detection in some criminal act is, perhaps, not very improbable.

As soon as Otho had returned into Germany, and begun to make some necessary regulations, he received the vexatious intelligence that Crescentius, having obtained the consulship in Rome, had expelled pope Gregory, and filled his place with another, who had assumed the name of John XVI. The emperor instantly marched with all possible expedition into Italy, made himself master of Rome, and treated the two usurpers with extraordinary severity: for the anti-pope, after having been deprived of his eyes and his nose, in the most cruel manner, was hurled from the top of the castle of St. Angelo; and Crescentius, after being exposed to public derision, and put to the torture, was hanged upon a very high tree, together with twelve of his adherents. He re-established Gregory, and published a decree, declaring, that for the future the Germans alone should have the privilege of electing a Roman emperor. In the year 1000, at the solicitation of the duke Boleslaus, he erected Poland into a kingdom, to be held as a fief of the empire, on condition of homage. Shortly after this event, Otho was again called into Italy to repel an invasion of the Saracens, and to crush a fresh revolt of the turbulent Romans. His exertions against the Saracens were attended with complete success, but the Romans openly refused to submit to his authority, and while he was assembling an army to revenge this insult, he was poisoned by a widow, whom he is said to have seduced under a promise of marriage. He died at Palermo in 1002, in the thirtieth year of his age, and the eighteenth of his reign. In his last moments, he fixed upon Aix-la-Chapelle as the place of his sepulture. Otho III. is reckoned to have had many great qualities, and he governed with vigour and success. In common with his father and grandfather, he was very liberal to the church, and it is said that two-thirds of the ecclesiastical benefices in Germany were granted by the first three Othos.

OTHO IV., emperor of Germany, was duke of Saxony, of the house of Brunswick, when, on the death of the emperor Henry IV., in 1197, Philip, duke of Swabia, his brother, in quality of guardian to his minor nephew, Frederic, assumed the administration of the empire. A party, instigated by pope Innocent III., rose in opposition to the house of Swabia, and elected Otho king of the Romans,

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He was at this time in Poitou, with his uncle Richard I. of England, and hastening into Germany, he collected forces, and repaired to Aix-la-Chapelle, where he was crowned by the archbishop of Cologne. On the other side, the partisans of the Swabian family conferred the same honour upon Philip, and a civil war desolated all Germany. Otho lost a powerful supporter on the death of king Richard; for John, who succeeded him, abandoned the interests of his nephew. In 1205, Otho took refuge in England, and Philip was left without a rival; but while he was treating for a reconciliation, and employing himself in gaining the affections of his subjects, he was basely murdered by a private hand in 1208. On this event Otho so ingratiated himself with the clergy and pope, that Innocent invited him into Italy to receive the imperial crown at his hands. In 1209 he crossed the Alps, and was crowned king of Lombardy at Milan, and emperor at Rome. In the following year he made incursions into the territories of Frederic, king of the Two Sicilies, although that prince was under the protection of the holy see. Innocent, enraged at this proceeding, fulminated an excommunication against him, which he caused to be published and generally circulated through the empire. He was deposed, and Frederic, the son of the former emperor, Henry VI., placed on the throne in his stead. Otho, without hesitation, returned to Germany, assembled his friends, and commenced hostilities against the opposite party: he was, however, soon defeated, and gladly retired to Brunswick, where he passed four years in a private condition, devoting himself to exercises of devotion, and then died, A.D. 1218. Univer. Hist.

OTHO, a celebrated chronicler of the twelfth century, the son of Leopold, marquis of Austria, and Agnes, daughter of the emperor Henry IV., was educated for the ecclesiastical profession, and was appointed, in very early life, by his father, provost of the college which he had founded at Newenburg, in Austria. He afterwards spent some years in his studies at Paris, and then became abbot of a monastery of Cisterians at Moribond, in Burgundy. In 1138 his brother, Conrad III., created him bishop of Friburg, in Bavaria. He afterwards accompanied that prince in his expedition to the Holy Land, and was frequently consulted by him in his affairs, as he was also by Frederic Barbarossa, who was his nephew. Otho died at Moribond in 1158. He is said to have been the first, or, perhaps, more probably, among the first of the German prelates who were versed in literature, and acquainted with the Aristotelian philosophy. It is, however, as a historian that his memory has been preserved. He composed a chronicle from the creation to his own times, in seven books: another book is added relating to antichrist, and the end of the world: also, in two books, a narrative of the actions of Frederic Barbarossa. These writings were first made public by John Capivian, and the chronicle was afterwards published, with the addition of more than 50 chapters, by Urtitius of Basil, in his History of celebrated Germans. It is also contained in the collections of Pistorius and Muratori.

OTHOMAN. See OTTOMAN.

OTHONE, *ὀθων* and *ὀθωνιον*, among the ancients, a kind of linen garment worn by women.

OTHONI, a word used by chemical writers for what they otherwise call the *mercury of the philosophers*, or *philosophic ops*.

OTHONNA, the name given by some authors to a stone found in Egypt, and described to be always in small pieces, and of the colour of polished brass: probably it is some species of the pyrites.

OTHONNA, in *Botany*, a name which occurs in Pliny,

and which is called *obovæ* by Dioscorides. The word is derived from *obovæ*, a linen cloth, or napkin, from the external downy or cottony clothing of some of the original species. Linn. Gen. 449. Schreb. 585. Willd. Sp. Pl. v. 3. 2371. Mart. Mill. Dict. v. 3. Art. Hort. Kew. ed. 1. v. 3. 276. Juss. Gen. 181. Lamarck Dict. v. 4. 664. Illustr. t. 714. Gærtn. t. 170. (Jacobæastrum; Vaill. Mem. Par. 1720. 15.)—Class and order, *Syngenesia Polygamia Neceffaria*. Nat. Ord. *Compositæ Discoidæ*, Linn. *Corymbifera*, Juss.

Gen. Ch. Common calyx perfectly simple, of one leaf, obtuse at the base, acute, equal, divided into eight or twelve segments. Cor. compound, radiated; florets of the disk perfect, numerous, tubular, five-toothed, scarcely longer than the calyx: those of the radius female, mostly eight, or as many as the segments of the calyx, ligulate, lanceolate, longer than the calyx, three-toothed, reflexed. Stam. (in the perfect florets) Filaments five, capillary, very short; anthers united into a cylindrical tube the length of the floret. Pist. (in the perfect florets) Germen oblong; style thread-shaped, scarcely longer than the stamens; stigma cloven, simple: the female or ligulate florets differ only in having their stigma reflexed and larger. Peric. none, except the unchanged, permanent calyx. Seeds only in the female florets, solitary, oblong, naked or crowned. Recept. naked, dotted.

Obf. In some species the seeds are crowned with down; in some the calyx is divided beyond the middle; in others it is only toothed, but the same shape or figure is observable in all.

Ess. Ch. Receptacle naked. Down generally none. Calyx of one leaf, divided, nearly cylindrical.

Obf. When this genus was first established by Linnæus, a number of plants were included in it, which are now referred to other places. Of those which remain, and which have the calyx of one leaf, the most essential mark of *Othonna*, the following are examples. Professor Willdenow has thirty-five species, and these are divided into two sections; the first of which comprises such species as have cut or pinnate leaves; the second, such as have their leaves undivided, and toothed or entire.

* *Leaves cut or pinnate.*

O. pectinata. Wormwood-leaved African Ragwort. Linn. Sp. Pl. 1309. Curt. Mag. t. 306. (*O. foliis pinnatifidis*: laciniis linearibus parallelis; Mill. Dict. t. 194. f. 2.)—Leaves pinnatifid or pectinated, downy; the segments linear, toothed at the outer margin. Native of Africa and the Cape of Good Hope. It flowers with us in May and June, and was introduced into the gardens by Mr. Philip Miller in 1731. Stem shrubby, two or three feet high, much branched, covered with a hoary down. Leaves white with down, cut into many narrow segments, almost to the mid-rib; these segments are equal and parallel, having two or three teeth at their tips. Flowers on long, axillary stalks, towards the extremities of the branches, of a yellow colour. Seeds purple. Linnæus observes that the whole plant is often tomentose, and that the stem is scarred.

O. pinnata. Pinnated African Ragwort. Linn. Suppl. 387. Willd. n. 8. Sims in Bot. Mag. t. 768.—Leaves pinnatifid; the segments lanceolate, entire, decurrent.—A native of the Cape of Good Hope, flowering with us in May. This plant was considered by Linnæus, in his *Species Plantarum*, as a variety of *bulbosa*, from which however it was separated, by Thunberg's advice, in the *Supplementum* of his son.—Root tuberous. Stem waved, almost prostrate, slender. Lower leaves pinnated; upper undivided, obovate,

obtuse; all of them glaucous. Flowers terminal, yellow. It is remarked, in the Botanical Magazine, that this species has "a very particular manner of sleeping, the petals being neatly rolled back every evening from the apex to the base, remain in this state till morning, when they again expand."

O. Athanasie. Fennel-leaved African Ragwort. Linn. Suppl. 386. Jacq. Hort. Seltenbr. v. 2. 62. t. 242. (Jacobæa africana fruticans, foliis abrotani major; Volek. Hort. 225.)—Leaves pinnate, thread-shaped. Calyx many-toothed.—Native of the Cape, flowering from December to February. Stem shrubby, round, scarred, erect, two or three feet high, branched, darkish brown, resinous. Leaves numerous, much spreading, pinnate; their segments lanceolate, grassy, or fennel-like. Flowers solitary, terminal, stalked, yellow, large, and handsome. The whole plant has a smell like turpentine.

O. abrotanifolia. Southernwood-leaved African Ragwort. Linn. Sp. Pl. 1310. (Jacobæa africana fruticans, foliis abrotani minor; Volek. Hort. 225. tab. ad finem.)—Leaves pinnate, much divided, linear. Joints of the stem villose.—Native of the Cape. It was cultivated by Miller in 1759, and flowers with us from January to March. Stem low and shrubby, branched. Leaves thick, like those of Sampire, and cut into many narrow segments. Flowers solitary, terminal, on short stalks, yellow.

** *Leaves simple, or undivided.*

O. tenuissima. Slender simple-leaved African Ragwort. Linn. Mant. 118. Willd. n. 32. Jacq. Hort. Schoenbr. v. 2. 61. t. 239.—Leaves thread-shaped, fleshy. Stem shrubby.—Native of the Cape, flowering in March and April.—Stems shrubby, erect, branched, four feet in height, scarred. Leaves scattered, sessile, linear, acute, entire, fleshy, hairy when young, smooth when old. Flowers solitary, on axillary stalks, yellow. Linnæus well guessed the genus by the habit; see Mant.

Willdenow enumerates twenty-two species under this section of the genus, and thirteen under the first. Jacquin makes *Cineraria perfoliata* of Linnæus an *Othonna*, but we are inclined to think with Willdenow that it should not be removed from the former genus. *O. filicaulis* of Jacquin does not appear to be generically distinct from *Cineraria perfoliata*.

OTHONNA, in Gardening, contains plants of the shrubby, exotic, evergreen kind, of which the species cultivated are; the bulbous African ragwort (*O. bulbosa*); the wormwood-leaved African ragwort (*O. pectinata*); the southernwood-leaved African ragwort (*O. abrotanifolia*); the buck's-horn-leaved African ragwort (*O. coronopifolia*); the stock-leaved African ragwort (*O. cheirifolia*); and the tree African ragwort (*O. arborescens*.)

Method of Culture.—All these plants may be increased, by planting slips and cuttings of the young shoots or branches during the summer months, in pots filled with fine earth, plunging them in an old tan hot-bed under glasses, carefully shading them from the heat of the sun till perfectly rooted; their striking may be promoted by being covered with small glasses. When they are become well rooted, they should be removed with balls into separate pots filled with loamy mould, placing them in a sheltered shady situation till autumn.

They should be preserved in a good greenhouse in the winter, having as much free air as possible, and in the summer placed in a sheltered warm situation.

The fifth sort may sometimes be preserved in the open ground in such situations.

They

They produce variety among other potted plants of the greenhouse kinds.

OTHUMA, in *Geography*, a town of Arabia, in the province of Yemen; 80 miles N.N.E. of Mocha. N. lat. $54^{\circ} 32'$. E. long. $43^{\circ} 57'$.

OTIBAR, a town of Spain, in the province of Granada; 12 miles W.N.W. of Motril.

OTIOSI, in the *Hebrew Customs*. The learned are exceedingly divided about the *decem otiosi*, ten idle persons, spoken of in the Jewish synagogues.

Some say they were the three presidents and the seven readers; others, that they were ten persons hired to attend constantly at the synagogue, because, without the number ten, it could be no regular synagogue, or legal assembly; so that the decem otiosi were ten idle folks kept in pay, to form by their presence a legal synagogue or quorum.

Vitranga, in his *Archi-Synagoga*, refutes this opinion; and will have the otiosi to have been ten directors or officers in the synagogue.

He shews, that each synagogue had its directors; that the number was greater or less, according to the dignity of the synagogue; that the smallest had at least two; that, from the earliest times, each synagogue had its chief, called *archi-synagogus*, who had two colleagues, to be present at the ceremonies, and other acts of religion, and to take care every thing were done with decency; but that the *archi-synagogus* reserved to himself the power of teaching: that, besides these three, the *archi-synagogus* named several readers, who read in the synagogue every sabbath, and that these made the decem otiosi of the synagogue; so called, because, being disengaged from all other employment, their whole attendance was on divine service.

OTIS, the Bustard, in *Ornithology*, a genus of birds of the order Gallinæ: of which the generic character is; bill subconvex; nostrils oval, pervious; tongue bifid, pointed; feet formed for running; three-toed, tall, naked above the thighs. Of this genus there are eleven species described in Gmelin, and nine by Latham. We shall, as usual, follow the arrangement of the former writer, noticing, as in other articles, those that belong to our own country by means of an asterisk.

Species.

***TARDA**; Great Bustard. Wave-spotted with black and rufous, beneath whitish, head of the male, and throat on each side, crested. This bird is found in the plains of Europe, Asia, and Africa, but has never been observed in America. In England it is met with on Salisbury Plain, and in the wolds of Yorkshire; it was formerly seen in flocks of forty or fifty. It is the largest of British land birds, weighing from twenty-five to thirty pounds. It runs with great rapidity, so as to escape the pursuit of common dogs, but falls speedily a victim to the grey-hound, which often overtakes it before it has the power to commence its flight, the preparation for which, in this bird, is slow and laborious. The female lays her eggs on the bare ground, never more than two in number, in a hole scratched out by her for the purpose; and if these are touched or soiled during her occasional absence, she immediately abandons them. The male is distinguished by a large pouch, beginning under the tongue, and reaching to the breast, capable of holding seven quarts of water. This is useful to the female during incubation, and to the young before they quit their nest; and it has been observed to be eminently advantageous to the male-bird himself, who, on being attacked by birds of prey, has often discomfited his enemies by the sudden and violent discharge of water

upon them. These birds are solitary and shy, and feed principally upon grasses, worms, and grain. They were formerly much hunted by dogs, and considered as supplying no uninteresting diversion. They swallow stones, pieces of metal, and other hard substances.

ARABS; Arabian Bustard. Ears with erect crests. It inhabits Asia and Africa, and is the size of the last.

***TETRAX**; Little Bustard. The head and throat of this species are smooth. It inhabits southern Europe and Asia; is rarely found in England; is seventeen inches long; the eggs are of a shining green; the flesh is blackish. The bill is grey-brown; crown black, with rufous bands; temples and chin reddish-white, with small dark spots; neck of the male black, with a white collar; body above varied with black, rufous, and white; beneath and outer edge of the wings white. It is shy and cunning; if molested it will fly two hundred paces, and run so fast that a man cannot overtake it.

AFRA; White-eared Bustard. It inhabits the Cape of Good Hope, and is twenty-two inches long. In the male the bill and legs are yellow; the crown cinereous; the wings with a large blotch; neck behind, and thighs above the knees, with a white collar; fourteen tail feathers; the female is cinereous, and her thighs and belly black.

BENGALENSIS; Indian Bustard. Black; area of the eyes brown; back, rump, and tail, shining brown. It inhabits, as its name imports, Bengal, and is thirteen inches long.

AURITA; Passarage Bustard. This species is black; the body above reticulate with brown; the hind head has four capillary feathers on each side, rhombic at the tips; the spot on the wings and ears white. It inhabits India, and is the size of *O. tetrax*. The bill is of a whitish-brown; the legs are yellowish.

HOUBARA; Ruffed Bustard. Yellowish, spotted with brown; feathers of the neck long, whitish, with black shafts; the quill-feathers black, with a white spot in the middle. It inhabits Africa and Arabia, and is the size of a capon.

RHAAD. This is an Arabian bird; the hind head of the male has a black-blue crest; the head is black; body above, and wings yellow, spotted with brown; the belly is white; the tail is brownish, with transverse black streaks. The bill and legs robust.

INDICA; White-chinned Bustard. The upper part is ferruginous, waved with white and black, beneath whitish; chin white; crown, area of the eyes, and a streak on each side the head, is black. It inhabits India, and is the size of the next species. The legs are brownish.

***OEDICNEMUS**; Thick-kneed Bustard. This species is greyish; the two first quill-feathers are black, white in the middle; bill sharp pointed; legs cinereous. It inhabits Europe, Asia, and Africa; feeds in the night on worms, caterpillars, and reptiles; breeds in holes, or among stones on the bare ground; the eggs are of a copper colour, spotted with darker red; makes a piercing shrill cry, and migrates. The bill is black; legs greenish-yellow; lower eye-lid naked, pale yellow; above and beneath the eyes there is a yellow line; from the bill under the eyes to the ears there is a brown line; the knees are thick, as if swollen; belly and thighs white.

CHILENSIS. Head and throat smooth; body white; crown and tail-feathers cinereous; primary quill-feathers black. It inhabits Chili, is even larger than the *O. tarda*; is gregarious, and feeds on herbs; it is thought not to belong to this genus. The tail, which consists of eighteen feathers, is short; it has four very thick toes.

OTISFIELD, in *Geography*, a town of America, in Cumberland county and state of Maine; E. of Bridgetown, and containing 450 inhabitants.

OTITES DIGITUS, the *ear-finger*, a name given by authors to the finger next the little one.

OTITIS, from *ous*, *the ear*, inflammation of the ear.

OTLEY, in *Geography*, a market town in the upper division of the wapentake of Skirack, liberty of Cawood, Wistow, and Otley, and West Riding of Yorkshire, England, is situated under a cliff called Chevin, near the south bank of the river Wharfe. This town was formerly remarkable for the great quantity of oats cultivated in its neighbourhood, and sold at the market, which is held on Friday, and still affords a very plentiful supply of that species of grain. Here was an hospital for lepers in the time of Edward II., who were bound to keep the bridge over the Wharfe in repair. No vestiges of this building now remain, neither can any traces be discovered of the ancient palace of the archbishops of York, to whom the manor of Otley was given by king Athelstan. In 1673 this town suffered severely from an inundation, which spread to a considerable distance over the adjoining country. Here is a free grammar-school, founded in 1611. The church is a large and rather elegant edifice, and contains a great variety of monumental erections in honour of the families of Fairfax, Fawkes, Vasafour, Palmes, and Pulleyn. From the population returns of 1811, Otley appears to contain 573 houses, and 2602 inhabitants.

The vicinity of this town presents to the eye a very rich and beautiful prospect, particularly when surveyed from the summit of the Chevin. It abounds with gentlemen's seats, among which Newhall, Weston, Farnley-Hall, Denton Park, and Harewood-House, are the principal. The latter, the chief seat of lord Harewood, is one of the most magnificent mansions in England. It was erected by the late lord, who laid the foundation in 1760. The style of the architecture is Corinthian; and the whole is fitted up suitably to its external grandeur. The extensive pleasure grounds and gardens were laid out by the justly celebrated Browne. Near this mansion may be seen the ancient church of Harewood, rendered truly venerable by containing the tomb of that illustrious and virtuous judge, sir William Gascoigne, of Gawthorpe, who committed to prison the then prince of Wales, afterwards Henry V., for offering insult to him on the bench. The ruins of the castle are seated on a lofty eminence overlooking the Wharfe. These are very extensive, covering above an acre of ground, but from their extremely dilapidated condition, it is impossible to form a correct idea of the construction and appearance of this immense pile in its pristine state. Farnley-Hall, the seat of Walter Fawkes, esq. is about three miles north of Otley, and is justly ranked among the finest mansions of the county, on account of the scale of the house, the style in which it is fitted up, its superb and valuable collection of paintings and drawings, and for the natural character of the surrounding country. Its present possessor has displayed, on many occasions, a refined taste, and sound political principles. Beauties of England, &c. vol. xvi. Yorkshire, by J. Bigland.

OTMARSCH, a town of Holland, in the department of Overijssel, seated on the river Dinckel; nine miles N. of Oldenzael.

OTODINI, in *Ancient Geography*, a people of Britain, N.E. of the Brigantes, who inhabited the countries now called Northumberland, Merse, and the Lothians. As the Otodini are not mentioned by any of the Roman historians, but only by Ptolemy, it is uncertain whether they formed

a distinct, independent state, or were united with the Brigantes. They were, however, a considerable people and possessed a long tract of the sea-coast, from the river Tyne to the Firth of Forth. Their name is derived by Baxter from the old British words "Ot o dineu," which signify a high and rocky shore, descriptive enough of their country. They were probably reduced by Agricola at the same time with their more powerful neighbours the Brigantes: but as they lived without the walls of Severus, they were, like the rest of the Maxata, engaged in frequent revolts. In the most perfect state of the Roman government in this island the country of the Otodini made a part of the Roman province called Valentia, which comprehended all that large tract between the two walls. As this province was never long together in the peaceable possession of the Romans, they had but few stations in the country of the Otodini, except those on the line of the wall of Severus. Besides these, there were two or three Roman towns without the wall, situated on or near the military way which ran through their country into Caledonia, which are mentioned both by Ptolemy, and in the Itinerary of Antoninus. These towns were Barmenium, now Riechester, and Curia or Constupitum, now Corbridge. Between these two towns, and at a little distance from the military way, at a place now called Rivingham, there are very conspicuous vestiges of a Roman station; which, from the inscription of an altar found there, appears to have been named Habitanicum.

OTOGAMIES, in *Geography*, a tribe of Indians in the N.W. territory, who inhabit between the lake of the Woods and Mississippi river. Its number of warriors is 300.

OTOMACS, or **OTOMAUQUES**, savages of America, on the Orinoco. For an account of them, see **OROXOOKO**.

OTOMO, in *Ornithology*, the name of a bird of the lagopus kind, called also *collestre*, and by the Germans *steinbum*, that is, *stonehen*. It is of the bigness of a tame pigeon; its belly and wings are white, with only a very few brownish feathers; its head, neck, and breast are variegated with brown feathers, and the upper part of the neck with black and white; its beak is very short and black, and it has fine red granulated membranes over its eyes; its tail is principally black, but is variegated with brown and white; and its legs and feet are feathered to the ends of the toes.

Mr. Ray is of opinion, that this is the same species of bird with the common white lagopus, it being no way different but in colour, and those birds being said to change colour in the summer months. It is caught in the mountains of Germany, and is a very delicate bird for the table.

OTOORACITE, in *Geography*, a small island in the South Pacific ocean, near the east coast of Otaheite.

OTOPLATOS, in *Surgery*, a fetid discharge from behind the ears.

OTOPUOSIS, from *ous*, *the ear*, and *πυον*, *pus*, a purulent discharge from the ear.

OTOQUE, in *Geography*, a small island on the west coast of New Mexico, in the bay of Panama; 30 miles S.S.W. of Panama. N. lat. 8° 30'. W. long. 80° 20'.

OTOROWA, a town of the duchy of Warsaw; 16 miles W. of Posen.

OTORRHŒA, in *Surgery*, from *ous*, *the ear*, and *ρρω*, *to flow*, a discharge of blood, or bloody matter, from the ear.

TOULINGOW, in *Geography*, a town of Chinese Tartary. N. lat. 43° 54'. E. long. 128° 16'.

OTRAHARMANA, LA, a small island in the East Indian sea, near the west coast of Luzon. N. lat. 15° 55'. E. long. 120° 6'.

OTRANTO, a province of Naples, bounded on all sides,

rides, the west excepted, by the sea. On the west it is joined to Bari. It is about 60 miles in length, and from 20 to 25 in breadth. Its principal productions are olives, figs and grapes. As a guard against the incursions of the corsairs, towers are erected at small distances along the coast. Besides Lecce, whence it is sometimes called "the country of Lecce," and Otranto, the principal towns are Tarento, Brindisi, Matera, Castro, Gallipoli, Motala, Sta. Maria de Leuca, Aleffano, Ugento, Nardo, Ostuni, and Castellaneta.—Alfo, a city and sea-port of Naples, and capital of the above province. It was a Roman colony, and erected into an archbishopric in the 16th century. It is seated on a rocky island, and joined to another island by a bridge, which, by another bridge, communicates with the continent. It is surrounded by walls and ramparts, and defended by a citadel on a rock. The harbour is good, and the trade considerable. It is the see of an archbishop; 94 miles S.E. of Bari. N. lat. 40° 30'. E. long. 18° 20'.

OTRAR, or FARAL, a town of Turkestan, on the Argh; formerly a place of great importance and considerable trade. After a brave defence, it was taken by Jenghis Khan. The celebrated Timur Bec died here; 55 miles W. of Taraz.

OTRAU, a town of Moravia, in the circle of Prerau; 20 miles N.E. of Prerau.

OTRICOLI, a town of Italy, in the Sabina, near the Tiber, formerly the see of a bishop. In this place are the ruins of a theatre and other magnificent buildings; 24 miles S.W. of Spoleto.

OTROKOTSKIFORIS, FRANCIS, in *Biography*, an Hungarian, who completed his studies at Utrecht, and became minister in his native country. He afterwards renounced the Protestant religion, and obtained some preferment in the state. He died at Tirnau in 1718. His works are, 1. "Origines Hungaricæ," 2 vols. 8vo. 2. "Antiqua Religio Hungarorum vere Christiana et Catholica," 8vo.

OTSEGO, in *Geography*, a county of New York, on the south side of Mohawk river; bounded north by Herkimer county, east by Schoharie, south by Delaware, and west by Chenango. This county is intersected by the headwaters of the Susquehanna, and the Cookquago branch of the Delaware. It contains 1788 inhabitants. The courts are held at Cooperstown, in the township of Otsego. In 1791, when the county was thinly settled, 300 chests of maple sugar, at 400 lbs. *per* chest, were manufactured here.—Alfo, a township and lake, in the above county. The township was taken from Unadilla, and incorporated in 1794. On the east the township includes lake Otsego, which separates it from Cherry valley. The lake is the head of Susquehanna river, and is about nine miles long, and somewhat more than a mile wide. The lands on its banks are good, and easily cultivated. The township contains 4224 inhabitants.

OTSKE, a town of Turkish Armenia; 20 miles N.W. of Akalzike.

OTT, JOHN HENRY, in *Biography*, a learned Swiss divine, was born in the canton of Zurich in the year 1617. He received the early part of his education at Zurich, and in 1635 was sent to pursue his studies at Lausanne. From thence he went to Geneva and Groningen; and in the latter place distinguished himself by his great proficiency under the instructions of Gomar and Alting. He then spent five years at Leyden and Amsterdam, chiefly in the study of the Oriental languages. After this he took a tour to England and France; and upon his return to his native country, he was presented with a good living, which he served

25 years. In 1651 he was nominated to the professorship of eloquence at Zurich; in 1655, to that of Hebrew; and in 1668, to that of ecclesiastical history. He died in 1682, leaving behind him a high reputation for various learning, and a great number of works, which were highly esteemed on account of the erudition displayed in them. Of these we may mention a treatise "On the Grandeur of the Church of Rome;" "Annals relating to the History of the Anabaptists;" "A Latin Discourse in favour of the Study of the Hebrew Language;" "A Latin Treatise on Alphabets, and the Manner of Writing in all Nations." He had a son, John Baptist Ott, born in 1661, who acquired great celebrity by his knowledge of the Oriental languages and antiquities. He was pastor of a church at Zollicken, and afterwards professor of Hebrew at Zurich. In 1715 he was promoted to the archdeaconry of the cathedral in that city. He was the author of several works of considerable reputation: as, "A Dissertation on Vows;" "A Letter on Samaritan Medals, addressed to Adrian Reland;" both these are written in the Latin language; a treatise in German, "On the Manuscript and printed Versions of the Bible before the Era of the Reformation;" and "A Dissertation on certain Antiquities discovered at Klothien, in 1724." Moreri.

OTTA, in *Geography*, a town of Portugal, in Estramadura; 24 miles N.N.E. of Lisbon.

OTTACANO, a town of Naples, in the province of Lavara; 11 miles E. of Capua.

OTTANI, GAETANO, in *Biography*, a tenor-singer in the service of the king of Sardinia, who, in 1770, with an excellent tenor voice, sung with taste, and in a pleasing manner. Though the opera-house was shut, and we had not an opportunity of hearing him on the stage, we heard him in private sing two or three airs in different styles, which discovered him to be a master of the art he professed. He likewise was a good painter in the manner of Claude Lorrain, and Du Vernet, and was sometimes employed by his Sardinian majesty as a painter.

OTTATI, in *Geography*, a town of Naples, in Principato Citra; 10 miles S.W. of Cangiaino.

OTTAVA, a town of Naples, in the province of Bari; 11 miles S.E. of Monopoli.

OTTAWA, a river which rises in the south part of Bohemia, and runs into the Muldau, 12 miles E. of Blatna.

OTTAWAS, or UTAWAS, called also *Grand River*, a river of Canada, which is the most important of all the tributary streams of the great river St. Lawrence, issues from various lakes towards the centre of Canada, and falls into the St. Lawrence about 30 miles above Montreal; forming, by its confluence with that river, "Le Lac de deux Montagnes et le Lac St. Louis," *i. e.* the lake of the two mountains, and the lake of St. Louis, in which are several islands. The water of the Utawas river is remarkably clear, and of a bright greenish colour; whilst that of the St. Lawrence, on the contrary, is muddy, owing to its passing over deep beds of coral for some miles before it enters into lake St. Louis. For a considerable way down the lake, the waters of the two rivers may be plainly distinguished from each other. At the mouth of the Utawas river is situated the island of Perot, about 14 miles in circumference, the soil of which is fertile, and well cultivated. The North-West Company principally carries on its fur-trade by the Utawas river. For this purpose they make use of canoes, formed of the bark of the birch tree; some of which are constructed upon such a large scale, that they are capable of containing two tons; but they seldom put so much in them, especially

especially in this river, as it is in many places shallow, rapid, and full of rocks, and contains no less than 32 portages. The canoes are navigated by the French Canadians, who prefer this employment to that of cultivating the ground. Having ascended the Utawas river for about 280 miles, which it takes them about 18 days to perform, they then cross by a portage into lake Nispissing; and from this lake; by another portage, they get upon French river, that falls into lake Huron on the north-east side; then coasting along this last lake, they pass through the straits of St. Mary, where they have another portage into lake Superior; and coasting afterwards along the shores of lake Superior, they come to the Grand Portage on the north-west side of it; from hence, by a chain of small lakes and rivers, they proceed on to the Rainy lake, to the lake of the Woods, and for hundreds of miles beyond it, through lake Winnipeg, &c. The canoes, however, which go so far up the country, never return the same year: those intended to bring back cargoes, immediately stop at the Grand Portage, where the furs are collected ready for them by the agents of the company. At the Grand Portage, and along that immense chain of lakes and rivers which extend beyond lake Superior, the company has regular ports, where the agents reside; and they have also established trading ports within 500 miles of the Pacific ocean. Weld's Travels through Lower Canada, &c. vol. i. See FUR.

OTTAWAS, a tribe of Indians who inhabit the east side of lake Michigan, 21 miles from Michillimackinack, in Wayne county or territory. Their hunting grounds lie between lakes Michigan and Huron. About 30 years ago they could furnish 200 warriors. A tribe of them also lived near St. Joseph's, and had 150 warriors. Another tribe lived with the Chippewas, on Saguinan bay, who together could raise 200 warriors. Two of these tribes, lately hostile, signed the treaty of peace with the United States, at Greenville, Aug 3, 1795. In consequence of lands ceded by them to the United States, government has agreed to pay them in goods 1000 dollars a-year for ever.

OTTENDORF, a town of Germany, in the duchy of Bremen, capital of a small county called Hadeln, on the river Meden; 24 miles N. of Stade. N. lat. 53° 50'. E. long. 8 53'.

OTTENGRUN, a town of Saxony, in the Vogtland; 6 miles S.W. of Oelsnitz.—Also, a town of Germany, in the principality of Culmbach; 4 miles N. of Munahberg.

OTTENHEIM, a town of Austria, on the north side of the Danube; 5 miles W.N.W. of Lintz.

OTTENSCHLAG, a town of Austria; 7 miles S. of Zwettl.

OTTENSTAIN, a town of Austria; 8 miles E. of Zwettl.

OTTENSTEIN, a town of Germany, in the bishopric of Munster; 25 miles W.N.W. of Munster.

OTTER, JOHN, in *Biography*, professor of Arabic at Paris, was born at Christianstad in Sweden, where his father had amassed considerable property. In 1724 he was sent to the high school at Lund, where he also applied himself to natural philosophy and theology; and here, by intercourse with persons of the Catholic persuasion, he began first to feel serious doubts with regard to the reformation introduced by Luther, and at length abjured the Lutheran tenets; and the count de Brancas, French ambassador at the Swedish court, resolved to send this new convert to France. He was admitted into the seminary at Rouen, and, after a residence of three years, was called to Paris by cardinal Fleury, who gave him an appointment in the post-office; a

situation for which he was exceedingly well qualified, by a very extensive knowledge of modern languages. Having recommended himself, by his talents and assiduity, to the notice of count Maurepas, that nobleman determined to send him to the East, in order that he might make himself master of the Oriental languages, and, at the same time, discover the best means of reviving the French trade in Persia. He accordingly embarked at Marseilles, in January 1734, and arrived at Constantinople in March. His principal object, while in this capital, was to learn the Turkish and Arabic languages: for that purpose, he frequented the company of the most learned men in that city, and particularly attached himself to Ibrahim Effendi, known as well by his literary labours, as by the establishment of a printing-office at Constantinople. Having attained a good knowledge of the languages referred to, he felt himself in a condition to proceed to Persia, which he did in December 1736. After a journey of eight months, he reached Ispahan, which exhibited a most melancholy spectacle, having been reduced almost to a heap of ruins by the fury of the Afghans, who, in the midst of a bloody war, had nearly over-run the empire. The situation of the country, at that period, deterring Otter from making any attempts towards the re-establishment of the French trade in Persia, he devoted himself to the secondary object of his journey, viz. the acquiring of the language. In 1739 he set out for Bufforah, on the Persian gulf, where he concluded a commercial treaty with the pacha of Bagdad, and where he resided nearly four years, first in a private capacity, and afterwards as consul of the French nation. The commotions which had agitated Persia spread at length to Bufforah; and in 1741, the spirit of insurrection rose to such a height, that the neighbouring Arabs, throwing off all restraint, appeared in a state of open rebellion. For two months they kept the town completely blockaded. Otter participated in the general distress, but the terror of the situation did not prevent him from pursuing the study of the languages. With the help of a preceptor, he began a translation of the New Testament into the Turkish language, for the use of the Christians in that neighbourhood; and he had nearly completed the work, when he received orders, in the month of May 1743, to return to France, which he did by the way of Constantinople. On his return, after an absence of ten years, he published, under the patronage of count Maurepas, a work entitled "Voyages en Turquie et en Perse, avec une Relation des Expéditions de Thamas Kouli Khan, Paris, 1748." This work, besides a great many useful observations in regard to the names and situations of places, determined by Arabian astronomers, remains of antiquity, natural history, and accounts of the manners and customs of the Persians, and other eastern nations, contains a short account of the revolution effected in Persia by the celebrated Kouli Khan, with some anecdotes of his life. (See KOULI KHAN.) Soon after the return of M. Otter to France, he was appointed by count Maurepas to be interpreter of the oriental languages in the king's library; an office which enabled him to render the knowledge that he had acquired during his long travels of more utility to literature. He began to compile a view of the political changes produced by the followers of Mahomet, from the origin of their religion to the present time; taking as a foundation of his work the writings of the celebrated Noviri, an historian of the 14th century, who is reckoned one of the most authentic sources of information on that subject. In 1746, after completing a part of this undertaking, he was appointed Regius professor of Arabic; and in 1748 he was elected a member of the Academy of Inscriptions. Soon after his admission,

admission, he read "A Dissertation on the Conquest of Africa by the Arabs;" and this was to have been followed by another of the conquest of Spain, but in consequence of his premature death, the work remained unfinished, as did several others which he had projected. He died at Paris, in 1749. Otter was a man of great learning and integrity, mild in his manners, and of a modest disposition. Gen. Biog.

OTTER, in *Geography*, an island in the North sea, on the coast of Norway, at the mouth of Romsdal bay. N. lat. $62^{\circ} 45'$. E. long. $7^{\circ} 9'$.

OTTER, a river of England, which runs into the sea, about 5 miles E. of Exmouth.

OTTER Bay, a bay on the S. coast of Newfoundland, between Bear and Swift bays, and near cape Ray.

OTTER Creek, a river of America, in Vermont, which rises in Bronley, and pursuing a northern direction about 90 miles, discharges itself into lake Champlain at Ferrisburg, receiving in its course about fifteen small tributary streams. It has several falls, between which the water is navigable for the largest boats. Vessels of any burden may go up to the falls at Vergennes, 5 miles from its mouth. The head of this river is not more than 30 feet from Batten Kill, which runs in a contrary direction and falls into Hudson's river.—Also, a small stream, which runs into Kentucky river, E. of Boonsborough.

OTTER, *Peaks of*, the highest mountains on the Blue Ridge of Virginia, which, measured from their bases, are supposed to be more lofty than any others in North America. The principal peak, according to Mr. Jefferson, is about 4000 feet in perpendicular height.

OTTER's Head, a lofty rock on the N. shore of lake Superior. N. lat. $48^{\circ} 4'$. W. long. $85^{\circ} 55'$.

OTTER, in *Zoology*. See MUSTELA.

OTTER, *Hunting*. See HUNTING.

OTTERBACH, in *Geography*, a river of France, which rises near Weissemburg, and runs into the Rhine, about 10 miles above Germerheim.

OTTERBERG, a town of France, in the department of Mont Tonnerre, and chief place of a canton, in the district of Kaiserslautern; 5 miles N. of Kaiserslautern. The place contains 1374, and the canton 5359 inhabitants, in 20 communes.

OTTERPIKE, in *Ichthyology*, the name of a large species of the *draco marinus*, or sea-dragon, called in English the *weaver*: it is not much larger than the weaver, but is of a great variety of beautiful colours; and, instead of the yellow side-lines which that fish has, this has rows of large black spots. See TRACHINUS *Draco*.

OTTERSBERG, in *Geography*, a town of the duchy of Bremen, defended by a fort with four bastions; 16 miles E. of Bremen. N. lat. $53^{\circ} 9'$. E. long. $9^{\circ} 11'$.

OTTERY St. MARY, a market town in the hundred of that name and county of Devon, England, is situated near the bank of the river Otter, at the distance of $12\frac{1}{2}$ miles from the city of Exeter and 161 from London. It is a large, irregularly built town, and is chiefly supported by its manufactories of flannel, serge, and other woollen goods. The market day is Tuesday every week, and Carlisle states there are fifteen fairs annually. Here is a grammar school, formerly kept by the father of the poet Coleridge. The church is a spacious edifice, possessing many singularities in its construction. On the north and south sides are square towers, which open into the body of the church, and form two transepts, as in the cathedral at Exeter. Both these towers are surmounted by small turrets and open battlements, and that on the north has likewise a small spire in

the centre. A chapel, erected by bishop Grandison at the north-west corner of the building, displays a very richly ornamented specimen of architecture, but this and almost every other part of the church has suffered much from neglect. The monuments are numerous, and many of them curious both with respect to design and execution. Close to the church-yard stand some of the old collegiate houses, belonging to a college which was founded here by the bishop above mentioned, "for a warden, ten vicars, a master of music, two parish priests, eight secondaries, eight choristers, and two clerks." In one of these buildings is a large hall, which Oliver Cromwell used as a convention room; and in Mill-street are the remains of the ancient mansion of the celebrated sir Walter Raleigh. According to the late population returns (1811), the houses in this town and parish are estimated at 587, and the inhabitants at 2880 in number. The petty sessions for the hundred are held here.

Clyst-house, lately built by lord Graves, occupies the site of one of the ancient palaces of the bishops of Exeter. It is a very noble edifice, and commands several rich and extensive views over the adjacent country. The other principal seats in this vicinity are Cadhay, and Faringdon-house. The latter is a very spacious mansion, and surrounded by luxuriant plantations. Windmill-hill, near this house, is said to have been the position of a Roman encampment. Polwhele's History and Antiquities of Devonshire, folio. Beauties of England and Wales, vol. iv. by John Britton, F.S.A. and E. W. Brayley.

OTTFRIDE, in *Biography*, a German Benedictine monk, who flourished in the ninth century, was a disciple of Rabanus, archbishop of Mentz, and spent the greater part of his life in the monastery of Weissemburg in Lower Alface. He became greatly distinguished in sacred and profane literature, and wrote a variety of works in prose and verse. He directed his attention to the improvement and purification of the German language, then called the Teutonic, and with this view drew up a grammar, or rather perfected in part that commenced by the emperor Charlemagne. In order that the common people might be instructed in the gospel history, he wrote a work in Teutonic rhymes, divided into five books, containing the principal circumstances of the life of Christ, taken from the four evangelists, and in the order of time. This work was published by Flacius Illyricus in 1571, but more correctly afterwards by Lambecius, who gives an account of the other works of Otfride, among which are "Homilies" upon the evangelists; and paraphrases on other parts of the sacred scriptures, &c. Moreri.

OTTINGHAH, in *Geography*, a town of Meckley; 68 miles W. of Munnypour.

OTTMACHAU, a town of Silesia, in the principality of Neisse, on the river Neisse; 6 miles W. of Neisse. N. lat. $56^{\circ} 20'$. E. long. $17^{\circ} 2'$.

OTTOK, a town of Croatia; 28 miles S.S.W. of Carlstadt.


OTTOMAN, or OTHOMAN, an appellation given to the empire of the Turks, or rather to their emperors, from Othomannus, or Ofman, the first prince of the family. This Ofman, to distinguish his followers from others, gave them the name of Ofmanles, from which, by the change of the *s* into *t*, we have made Ottomans; which new name soon became formidable to the Greeks of Constantinople, from whom Ofman conquered a sufficient extent of territory to found a powerful kingdom. He soon bestowed on it that title, by assuming, in 1300, the dignity of Sultan, which signified absolute sovereign. The true era of the Ottoman empire may be dated from the conquest of Prusa. The establish-

establishment of the Ottomans in Europe took place A.D. 1353. See ORCHAN, OTHMAN and TURKEY.

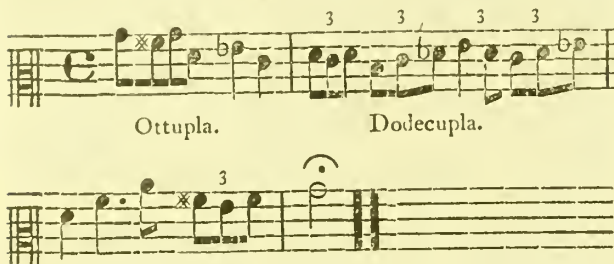
OTTONE, in *Geography*, a town of the Ligurian republic; 21 miles N.E. of Genoa.

OTTSBERG, OTZBERG, or *Utzberg*, a town of Hesse-Darmstadt; 26 miles N. of Heidelberg.

OTTUPLA, in the *Italian Music*, signifies *ottuplo*, or the measure of four times: it is marked with a femicircle,

C; and sometimes thus:  when it is to be played very

quick. In this time, eight quavers are contained in a bar. But it often happens, that suddenly, instead of two quavers for every time of the bar, three are required; this is called *dodecupla*. It is enough to place a 3 over three quavers, or notes of equal value, to shew that the measure must be changed; and when this 3 is omitted, it sufficiently demonstrates the measure to be ottupla again: this makes what is called by the Italians *ottupla è dodecupla*, thus:



Corelli, in the last movement of his tenth sonata, opera terza, very often uses an 8 for the dodecupla, to shew, that the triple time is changed to common time.

OTTWEILLER, in *Geography*, a town of France, in the department of the Sarre, and chief place of a canton, in the district of Sarrebruck; 13 miles N. of Sarrebruck. It is situated among mountains, and contains a castle, a Protestant and Roman Catholic church. The place includes 1460, and the canton 7288 inhabitants, in 28 communes.

OTUBUE, a small island in the South Pacific ocean, near the coast of Bolabola.

OTUGUNGE, a town of Bengal; 24 miles S. of Calcutta.

OTURA, a town of Spain, in the province of Grenada; 5 miles S. of Grenada.

OTUS, in *Ornithology*, the name of the common horn-owl of the smaller kind, in many respects different from the great horn-owl or eagle-owl. See STRIX.

OTUTUCLA, in *Geography*. See MAOUNA.

OTWAY, THOMAS, in *Biography*, an eminent writer of tragedy, born in 1651, at Trotting in Sussex, was educated at Wickham, near Winchester, and in 1669 he was entered a commoner of Christchurch, but he left the college without taking his degrees, and without any determination as to the profession which he meant to pursue. He went to London and commenced actor, but not meeting with much success he turned his thoughts to writing for the stage, and in 1675 produced his first tragedy of "Alcibiades." In the same year he brought out his "Don Carlos, Prince of Spain," which proved a source of great profit, and rescued the author from a state of extreme indigence. Either his talents as an actor or a writer introduced him to the acquaintance and patronage of men of fashion and pleasure, among whom was the earl of Plymouth, a natural son of Charles II., who procured for him the commission of cornet in a newly raised regiment destined for Flanders. This was in the year 1677, and he

accompanied his troops to the continent; through habits of dissipation he returned very soon in a state of poverty, resumed the occupation of writing for the stage, and among other pieces he composed two tragedies on which his fame is chiefly built, namely "The Orphan," and "Venice Preserved." These made their appearance in 1680 and 1682. In 1685 he was obliged to conceal himself from his creditors, and took refuge in a public-house on Tower-hill, where, on the 14th of April, he terminated a miserable life, at the early age of thirty-four. It was reported, that being nearly famished, he begged a shilling of a gentleman, and that he was actually choked with the bread which he purchased and was devouring in the most ravenous manner. Dr. Johnson does not give credit to the story, and Pope was informed that he died of a fever, occasioned by his exertions in the pursuit of a thief who had robbed one of his friends. "His memory," says one of his biographers, "associated with the tender scenes that he has written, has been celebrated in various pathetic lamentations for his hard fate, but like many of his fellow-sufferers, he was too deficient in moral qualities to excite that regard which is the only foundation of sober sympathy. Besides the dissoluteness of manners displayed in his life and writings, he was a shameless flatterer of the great, and seems to have had no other public principle than that of a servile attachment to authority." The tragedies already mentioned are justly accounted some of the most tender and pathetic that the English theatre exhibits. No English poet ever excelled him in touching the passions. The heart that does not melt at the distresses of his Orphan can scarcely be human. "Venice Preserved," without a virtuous character excepting the heroine, at all times excites the deepest interest, and is at this day very popular, and frequently acted in London, and at the most respectable country theatres. Although its purpose was to paint the horrors and vices of popular infurrection, he has put into the mouth of his revolutionary hero such forcible declamation against the corruptions of government, and such glowing sentiments of patriotism, that it has, occasionally, even in our times, been thought unfit for public representation. Besides his dramatic works he composed some pieces of poetry, which, however, have very little merit. The latest edition of Otway's works is that of the present year, 1813, in four vols. 8vo. In the year 1719 was printed a piece ascribed to Otway, but certainly not written by him; it was called "Heroic Friendship." That at the time of his death he had made some progress in a play, is pretty certain from the following advertisement, printed in L'Estrange's *Observer*, Nov. 26, 1686: "Whereas Mr. Thomas Otway, some time before his death, made four acts of a play; whoever can give notice in whose hands the copy lies, either to Mr. Thomas Betterton, or to Mr. William Smith, at the Theatre Royal, shall be rewarded for their pains." *Biog. Brit. Johnson's Lives of the Poets, and Biog. Brit.*

OVA, EGGS, in *Natural History*. See EGG.

OVA, in the *Human Anatomy*. See FÆTUS and GENERATION.

OVA, among the ancients, a kind of verses, wherein the verses were reduced to the form of an egg.

OVA, in *Architecture*, are ornaments in form of eggs, carved on the contour of the ovolo, or quarter round; and separated from each other by anchors or arrows' heads.

The English usually call these ornaments *eggs and anchors*.

Instead of eggs, the ancients sometimes carved hearts, on which occasion it was that they introduced arrows, to symbolize love.

OUABASH, in *Geography*. See WABASH.

OUA-

OUA-CONG-YN, a town of Thibet; 32 miles S.W. of Hami.

OUADA, or GOA, a town of the Ligurian republic, on the borders of France; 18 miles N.N.W. of Genoa.

OUAGIK, a town of Asiatic Turkey, in Natolia; 3 miles S. of Ismid.

OUAIS'S BAY, a bay on the N. coast of the island of cape Breton, in the gulf of St. Lawrence.

OVAL, in *Geometry*, a curve resembling the contour of an egg, whence its name. The proper oval, or egg-shape, is an irregular figure, being narrower at one end than it is at the other; that is, the extreme breadth is not in the middle of its length. In this it differs from the ellipsis, which is the mathematical oval, and is equally broad at both ends.

In the common acceptation of the word the two curves are confounded together, but geometers consider the oval as a false ellipsis. A figure bounded by circular arcs, so meeting as to coincide at the points of meeting with the tangents to the arcs, and as it does not in appearance differ from an ellipsis, is by artificers called an oval.

It may be thus described, to any given length and breadth. Let the given length AB, (*Plate II. fig. 1. of Drawing Instruments*), and breadth DE, bisect one another, at right angles, at the point C; assume the distances AF, LB, equal to each other, but less than half the breadth CD. Take DG equal to AF; join FG, which divide into two equal parts at H, and from H draw the right line HI perpendicular to FG, meeting the diameter CE in I, and set off CK = CI, draw IN and IO, KM and KA. This done, about the centres F and L, with the distances AF, LB, describe two small arcs MAN, ABO; which will form the ends of the curve; and about the centres K and I, with the distance IN, describe two arcs NDO, MEA, and the oval required will be described. This curve, though it is called an oval, differs both from the true ellipsis, produced by the oblique section of a cone or cylinder, and also from the oval or egg-shape figure, which is broader at one end than at the other: in fact, it is nothing more than segments of different circles combined into one curve, which rather imitates the ellipsis than the oval, its ends being similar.

The egg-shaped curve may be described by means of an instrument which has of late been produced with the intention of describing ellipses, though for this purpose it is inapplicable: the principle of its action is explained by *fig. 2. Plate II.* In this, suppose AB an inflexible right line or ruler, the end B connected by a joint to a crank C, which revolves upon a fixed centre D; therefore the end B of the ruler describes the circumference of a circle; the end A of the ruler has a pin projecting from the under side of it, which enters a narrow straight groove, its direction being in the line of the centre D: this groove confines the end B to move in a right line tending to the centre of the circle, which the other end, A, describes when the crank is turned round. Now a tracing-point applied at any part of the line AB, will describe a real oval or egg-shape, the proportion between its length and breadth being determined by the part of the ruler where the tracer is applied; suppose it at G, which is half way between the two extremes A, B, then the breadth will be very nearly equal to one-half of the length; at D, which is one-fourth from B, the breadth will be very near three-fourths of the length; and at F, which is one-fourth from the end A, the breadth will only be about one-fourth of the length. It is easy to explain this: the length of the oval must evidently be equal to the diameter of the circle described by the crank C; but the breadth will be diminished from this quantity, in the proportion of the parts of the lever AGB, con-

sidering the end A as its fulcrum, B the point where the action is applied, and G the point where the effect is produced. This reasoning is general, for if the tracing-point is considered as removed to the point B, or within a very small distance from it, the oval will have its diameters equal to each other, or the difference between them will be exceedingly small, in which case it becomes a circle, or very near it: in like manner, if the point is removed to A, the breadth of the oval will be nothing, producing a straight line. If the ruler is continued beyond the crank to the point H the curve is altered, the breadth being equal to the diameter of the circle, and the length increased in proportion to the lever ABH. The reason why this curve is larger at one end than the other is, that the point of greatest elongation of the point B, is when the crank C forms a perpendicular with the ruler AB; this happens at the point *a* of the circle, and produces the greatest breadth of the curves, as is shewn at *bcd*; but these points are not equidistant, from the two extremes of the length, which will be at *e*, *f*, and *g*; therefore, the line of greatest breadth, of all curves described by this means, will not divide the length into equal halves, which is an essential condition of the mathematical ellipsis.

The true, or mathematical ellipsis, is a curve which so frequently occurs in delineating circular objects in perspective, that artists, as well as geometers, have been anxious to discover a general mode of drawing such curves to any dimensions and proportions. The principles of several methods are given in the article ELLIPSIS; but only one of these has been applied in the construction of instruments, (see COMPASSES, *Elliptic*), which is generally denominated by artificers a trammel: this is imperfect, because it will not describe very small or narrow ellipses, such as are chiefly required in drawing.

Mr. Wilson Lowry, whose engravings accompany this work, has for some years made use of a very perfect and curious machine for engraving the ellipses on his plates, many beautiful specimens of which are to be found in our plates of astronomical instruments, horology, planetary machines, &c.; it operates upon the principle of the elliptic chuck used by turners for forming picture frames, and other elliptical work (see ROSE ENGINE); but being constructed with various adjustments for the purpose of engraving only, it is not so applicable for drawing, as another instrument upon a new construction, invented by Mr. John Farey, jun. from whose drawings most of the above subjects are engraved. The Society of Arts have lately presented the inventor with their gold medal for this instrument, which is described in the 31st volume of their Transactions. A plan of it is given in our plate at *fig. 3*, and an edge view in *fig. 4*, shewing its thickness. The general size is twice as large as the drawing, but it may be made of any dimensions at pleasure. When used, it is placed upon the paper or surface where the ellipsis is to be described, and the square frame is held fast by the left hand, while the moving circles are turned round by the other, to trace the curve by means of a drawing-pen properly situated. The moving parts of the instrument consist of two circles, A, B, of equal dimensions, so fitted together that they will slide one upon the other, by means of the pinion K, used to separate their centres any required distance within their radii.

The circles have no central bar, but instead thereof have two bars *aa*, *aa*, parallel to each other, and at some distance from the centre, leaving an open space between them, in which the drawing-pen or tracing-point is situated: there are two crooked arms *b*, *b*, proceeding from the bars *a*, *a*, to the circular rim, to give it sufficient strength; and these being all the bars across the circles, leave them very open

to see the curve, as it is traced beneath by the drawing-pen. The circles are united by screws at *c, c*, screwed into the lower circle, and the two bars of the upper circle, being included between them, keep the two together, but at the same time admits of their sliding one upon the other, in the manner of the figure: at *ee* are two other screws tapped into the upper circle, and retaining the lower one in the same manner. The centre-pin for the pinion *K* is fixed on one of the arms of the lower circle, and acts upon a rack, *d*, screwed to the upper circles, so that it separates the two, when turned round by the finger and thumb, applied to the milled head upon it.

The circles are fitted together so tight by the screws *cc*, and *ee*, that they will not separate from each other, except by the action of the pinion; and may, in the use of the instrument, be considered as firmly united together, though capable of having any degree of excentricity given to them by means of the pinion *K*.

The circles are turned round in their frame by means of six small handles, *f*, fixed in the upper circle, to any opposite two of which the thumb and finger of the right hand may be applied. The frame, or fixed part of the instrument, consists of four straight rulers *D, E, F, G*; the latter are screwed down upon the former, and are therefore in a plane above them, as shewn by *fig. 4*, plates of brass being interposed between them at the angles, to separate them to a proper distance. The lower circle, *A*, is fitted in between the two lower rulers *D, E*, and slides freely in the direction of their length, but has no shake sideways: in like manner, the upper circle, *B*, is included between the edges of the rulers *F, G*, and therefore moves in a right line, in a direction perpendicular to the former. Thus the frame forms two grooves at right angles to each other, in which the circles revolve with an excentric motion, the upper circle sometimes hanging over the lower rulers, and the lower circle passing under the upper rulers, as is shewn in the figure. The result of this motion is, that a tracer, placed on any part of the circles, when they are rendered excentric, will describe an ellipsis on the surface beneath; but the only tracer which is used in drawing is situated between the bars *a, a*: thus, into this space a small carriage, or frame, *g*, is fitted, to slide freely from one end of the opening to the other, by means of a rack, *b*, screwed on one side of it, and a pinion, *L*, turning on a centre-pin, fixed into the upper circle: the frame has a brass socket, *H*, moving on a centre-pin, and having a hole in it for the reception of the leg of a pair of common drawing compasses, *M*, which stand as in *fig. 4*: when in use, the pen, *M*, traces the curve upon the paper, but they admit of being turned up on the centre-pin of the socket *H*, and then, for the convenience of setting the instrument, the circles can be turned about without making any marks. The transverse section (*fig. 5*.) shews the frame *gg*, and the manner in which it is fitted into the circles, *A, B*, also the socket, *H*, moving on its centre-pin, and the two pair of racks *d, b*, and pinions *K, L*; the former for the purpose of separating the circles, and the latter for moving the pen-frame, *g*, along between them: the frame, *g*, is so fitted, that it continues at the same point with respect to the upper circle, when the centres of the two are separated from each other by the pinion *K*, and may, therefore, be considered as immoveable when the lower circle only is moved.

To keep the frame of the instrument stationary upon the paper whilst it is used, two sharp pins are fixed in the ruler *P*, which penetrate the paper, and make it quite fast, when they are held down by the finger and thumb of the left hand applied upon the heads of nuts *N, O*; these are in-

troduced to unite the ruler *P* with the ends of the two upper rulers *F, G*, but the screws of these nuts passing through grooves in the ruler *P*, admit the whole instrument to be moved on the paper, a small quantity, parallel to itself, in the direction of the ruler *P*; though the friction of the fitting is so great, that it will not move unless some force is applied for that purpose: the screws where they pass through the ends of the rulers *F, G*, are also received in grooves, so that by unscrewing the nuts the whole instrument can be moved sideways, a small quantity nearer or farther from the ruler *P*; but by screwing these nuts fast, the screws become fixed to *F, G*, though they still admit of moving in the grooves of the ruler *P*.

The reader will now comprehend the structure of the instrument. The circles are capable of revolving in the frame, set with any required degree of excentricity, and the tracing-point or pen can be removed to any required distance from the centre of the upper circle. The compasses being opened to the extent of two marks made upon one of the bars, *G*, of the frame, and then being fixed in the instrument by pushing them into their socket *H*, it is ready for use. In this state, suppose the two circles set by the pinion, *K*, exactly concentric with each other, and the pinion, *L*, turned till the end of the frame, *g*, comes in contact with the rim of the instrument, then the point of the tracer will come exactly in the centre of both circles, and the circles being turned round in the frame, the pen will only mark a small point on the paper, which will be the centre of any curve the instrument may be made to describe. By turning the pinion, *L*, the breadth of the ellipse will be determined, and by the other the difference between its breadth and length is regulated. Suppose the pinion, *K*, turned to render the circles excentric, without moving the other, and the pen therefore remains in the centre of the upper circle; in this case the pen will describe a straight line, equal in length to twice the excentricity of the circles: this is evident, because the circumference of the upper circle moving against the straight edges *F, G*, its centre must describe a line parallel thereto: this case may be considered as an ellipse without breadth, for if the pen is set the smallest quantity out of the centre of the upper circle, it will draw a very narrow ellipse, and by setting it at different distances from the centre, any required proportion of ellipse may be described.

The conjugate diameter will, in all cases, be equal to double the distance from the point of the pen to the centre of the upper circle, and the difference of the conjugate and transverse diameters will be always equal to twice the excentricity of the two circles.

The principle on which this instrument operates is the same as the trammel employed by carpenters and other artificers for striking ovals, by means of a board with two cross grooves in it, and a beam or radius-bar, which has two pins to slide in the grooves, and a third to draw the curve. To prove this, suppose *PP* and *QQ*, (*fig. 6*.) to be the two diameters of the intended ellipses; then if the three points, *d, e*, and *f*, are fixed upon an inflexible bar, and the points *d* and *e* constantly applied to the two diameters, while a tracing-point, situated at *f*, is carried round by the bar; the latter will describe an ellipse. This is the principle of the trammel; but its defects, as at present constructed, are well known. 1. It will not draw any ellipsis, which is less in either of its dimensions than the size of the board or frame containing the cross grooves representing the two diameters *PP* and *QQ*; nor can it draw much larger, unless the diameters are nearly equal. 2. It is difficult to fix the crosses firmly on the paper, or to bring it to the exact point required for the centre of the ellipse. And 3. When this is done,

done, the most perfect workmanship in the grooves and sliders can scarcely ensure that it shall move freely without shake or improper motions, so as to make an accurate and fair curve.

All these defects are obviated in the present invention, by extending the two points *d* and *e*, to become the large circles A, B, *fig. 3*; then the rulers D, E, F, G, represent the sides of the grooves in which the points move: the point of the pen of the compasses now represents the point *f* in all its properties of moving along the bar, to enlarge or diminish the ellipse, but with the advantage that it can be actually brought to coincide with one of the points *d* or *e*, when of course it will draw a straight line, and if brought to match with both of them, it will describe only a point; therefore this instrument will describe any possible variety of ellipse within the limits of its radius, either as to size or proportion of its diameters.

In the use of this instrument, when any ellipsis of given dimensions is to be drawn, the paper is prepared by drawing the two diameters about four inches long; upon each of these set off, with the compasses, the four points where the intended curve is to intersect the lines. This preparation is not essential, but it assists in setting the instrument in its true place. The drawing pen of the compasses is to be filled with Indian ink from a camel's-hair pencil, and the screw adjusted, that the pen will draw a proper line; then the leg of the compasses being fixed into the brass socket H, so that they have no shake or looseness in the fitting, the instrument is ready for use; turn the circles about in the frame, to bring the pen towards the side marked G; now place the whole instrument in such a position, that the centre of the four rulers coincides with the centre of the intended ellipsis. This may be estimated, or, by previously producing the two diameters, the frame may be set very nearly, taking care to place the upper rulers F, G, parallel to the greatest diameter: here fix the instrument by pressing the two pins or points of the ruler P into the paper, and hold it fast by placing the thumb and fore-finger of the left-hand upon the nuts N, O, leaving the other hand at liberty to turn the circles about, by applying the finger and thumb to any opposite two of the small handles *f*. Now by turning the pinion L, remove the drawing pen to the mark made for the extent of the shortest diameter of the ellipsis; then turn the circles one-half round by the handles, and examine if the point of the pen comes exactly to the opposite mark for the end of the shortest diameter; if it does not, adjust the error, one-half by moving the pen, by turning the pinion L, and the other half, by moving the whole frame on the paper. The screws of the nuts N, O, will admit this motion, being fitted into grooves in the ruler P, (which should not be disturbed,) but the nuts should not be screwed so tight as to prevent the motion; then, by returning the circles back again its accuracy will be ascertained; for if it meets the former mark, it proves that the circles are in the right centre, and the compasses are set to the proper diameter for the conjugate axis: now turn the pen towards the length of the ellipsis, and without altering the compasses or pinion L, slide the circles one upon another by the pinion K, till the point of the pen arrives at the mark made for the length of the ellipsis: turn the circles half round to the opposite end, and if they match the mark made there the adjustment is correct; if not, one-half the error must be corrected, by moving the circles by their pinion K, and the other by moving the whole frame sideways on the paper. To do this, the nuts N, O, must be made slack, and then the frame will be at

liberty to move; but the ruler P must never be removed after the first fixing, and the side of the frame will, of course, be at a greater or less distance from it. The adjustments being made in this manner, the pen may be suffered to rest upon the paper and trace round the curve. The precautions of turning the circles to the opposite sides will be unnecessary, except where great accuracy is required. In turning the circles about, a habit will be acquired of pressing with equal force on the two opposite sides of the circles, and then they will turn round easily.

It will save much trouble, in adjusting the place of the instrument upon the paper, if the compasses, before being put into the socket H, are opened to the extent of the two marks upon the bar G; then the compasses are put into their socket, and if this is removed by turning the pinion, L, till the end, *g*, comes in contact with the rim of the circle, the point of the pen will come exactly into the centre of the ellipsis which it is intended to describe; if, therefore, the centre of the ellipsis is marked upon the paper, and the point of the pen (when opened to the above extent, and the socket kept back as far as it will go) being brought by moving the whole frame on the paper to this mark, the instrument is adjusted at once as to its position on the paper, and the other adjustments for the dimensions of the ellipsis required to be drawn may be made as before directed.

After having drawn an ellipsis, if it is required to draw another parallel to it, to shew the thickness of a circular plate, for instance, set the pen opposite G, and by the screws of the nuts N, O, as before mentioned, being fitted in grooves, the frame and the circles may be moved with the longer axis parallel to itself, so as to describe another ellipsis parallel to the former. By this means all kinds of circular mouldings, wheels, &c. may be drawn with the greatest accuracy and expedition; but the various uses to which it is applicable, are best shewn by the numerous perspective drawings in our plates, wherein Mr. Farey employs it for all the ellipses.

OVAL Column. See COLUMN.

The ancients have been represented as authorising this deformed figure for the plan of a column: but this is a mistake, probably occasioned by the discovery of fragments, where flanked columns have been set back to back against a screen or wall of nearly the same width with the diameters of the columns: these remains, defaced by time, might suggest, to a superficial enquirer, that the column originally had an oval base.

OVAL Crown. See CROWN.

OVAL Ellipsis, an oblong curvilinear figure with two unequal diameters; or a figure enclosed with a single curve line, imperfectly round, its length being greater than its breadth, like an egg; whence its name. See OVAL.

The method of describing an oval, chiefly used among workmen, is by a cord or string, as F *f* M (*Plate IX. Conics, fig. 18.*) whose length is equal to the greater diameter A B of the oval, and which is fastened, by its extremes, to two points or nails, F, *f*, planted in its longer diameter; by which means the oval is made so much the longer, as the two points or nails are farther apart.

OVAL Foramen, *Ruptures of*, in Surgery. See HERNIA.

OVAL Leaf, in Botany. See LEAF.

OVALALDE, in Geography, a town of Africa, in the country of the Foulahs, on the side of the Senegal. N. lat. 18° 45'. W. long. 13° 8'.

OVALE FORAMEN, in Anatomy. See HEART.

OVALLE, ALONZO DE, in Biography, a Jesuit, was born

born at Santiago in Chili, and became procurador-general of the order in that province. He went to Rome to obtain a supply of missionaries, and there he published a work entitled "Historica Relacion del Reyno de Chile, y de las misiones y ministerios que exercita en el la Compania de Jesus," 1646. "This," says Mr. Southey, "is a book of great value, though it is meanly printed, and the engravings are execrably bad. At the end of the copy now before me are some views of the Jesuit settlement in Chili, and of the six principal forts, which were published separately to be purchased at pleasure. They are, without exception, the very worst I have ever seen." An abridgment of Ovalle's work is in Churchill's collection. Gen. Biog.

OUAN, in *Geography*, a town of Corea; 53 miles W.S.W. of Koang.—Also, a town of China, in the island of Hai-nan; 75 miles S. of Kiong-tcheou.

OUANAMINTHE, a town of Hispaniola; 15 miles S.E. of Fort Dauphin.

OUANDERON, in *Zoology*. See *SIMIA Silenus*.

OVANDO, in *Geography*, a province or duchy of the kingdom of Congo in Africa, situated between Congo and Angola, now in the possession of the Portuguese, but formerly subject, or tributary, to the kings of Congo. Its capital, called St. Michael, is seated on the river Danda, but is a place of no great note.

OUANGARUM, a river of Canada, which runs into the St. Lawrence, N. lat. $44^{\circ} 37'$. W. long. $75^{\circ} 45'$.

OUANG-KOA, a town of Corea; 28 miles E.S.E. of Koang-tcheou.

OUANLIN-HOTUN, a town of Chinese Tartary; 588 miles N.E. of Peking.

OUANNE, a town of France, in the department of the Yonne; 9 miles S.W. of Auxerre.

OUAQUAPHENOGAW, or EKANFANOKE, or *Okefonoke*, a lake or rather marsh of America, between Flint and Oakmulgee rivers, in Georgia, about 300 miles in circumference. In wet seasons it appears like an inland sea, and has several large islands of rich land, one of which is represented by the Creek Indians as the most blissful spot on earth. They say it is inhabited by a peculiar race of Indians, whose women are incomparably beautiful. They also relate many other wonderful stories concerning this island, which it is needless to recite.

OUANTOU, in *Ornithology*. See *PICUS, lineatus*.

OVAR, in *Geography*, a considerable town or villa of Portugal, in the province of Beira; 15 miles S. of Oporto. It contains 1300 houses, of which many are large and handsome. An arm of the Vouga, which is properly a lake, and which is narrow for three leagues and then becomes much broader during a league, then forming a true lake, and at length ends in a narrow channel a league long, ceases close to Ovar.

OUARA, a town of Hindoostan, in Bahar; 65 miles S.S.W. of Patna.

OUARANGUE, a small island in the Atlantic, near the coast of Africa. N. lat. $11^{\circ} 32'$.

OUARDAN. See *VAKDAN*.

OUARINE, in *Zoology*. See *SIMIA Beelzebub*.

OVARY, in *Anatomy*. See *GENERATION*.

OVARY, *Dropsy of*. See *DROPSY*.

OVARY of Birds. See *Anatomy of BIRDS*.

OVARY of Fish. See *FISH*.

OUASIOTO MOUNTAINS, in *Geography*, mountains of America, situated N.W. of the Laurel mountains in North Carolina and Virginia; 50 or 60 miles wide at the Gap, and 450 in length, N.E. and S.W. They abound in coal, lime,

and free-stone. Their summits are for the most part covered with good soil and a variety of timber, and the intervening lands are well watered.

OVATED LEAF, among *Botanists*. See *LEAF*.

OVATION, OVATIO, in the *Roman History*, a lesser triumph allowed to commanders for victories won without the effusion of much blood; or for the defeating of rebels, slaves, pirates, or other unworthy enemies of the republic.

Their entry was on foot; sometimes on horseback; but never in a chariot: and they wore crowns of myrtle, called *ovales*; having all the senate attending in their retinue.

The denomination ovatio, according to Servius, and Plutarch, in his life of Marcellus, is derived from *ovis*, *sheep*; because the conqueror sacrificed a sheep on this occasion to Jupiter; whereas, in the greater triumph, they sacrificed a bull.

Others derive it from the sound or din of the acclamations and shouts of joy, made by the people, in honour of the solemnity; the people and soldiery, on this occasion, redoubling the letter O, as in the great triumph they did the words, *Io triumphe*.

The ovation was first introduced in the year of Rome 325, in honour of the consul Posthumus Tubertus, after his defeating the Sabines.

OUBINSKOI MOUNTAINS, in *Geography*, otherwise called *Bobrofskoi*, mountains of Russia, which form, at the sources of the Ouba and Ulba, a considerable ridge, towering in lofty summits to high snow-mountains, sending out its branches on both sides of those rivers, especially between them, and at its foot bordered by the Irtisch. The greatest height rises near Bobrofskaia with porphyry, which in the north and south is frequently changed for granite, whose summits, sometimes with gentle, and then with bold ascents, surround the most delightful vales, abounding in odoriferous herbs of various kinds. In the region about the fortrefs Oultkamencyorsk, the granite is under-run by schistose earth, in ancient times explored by the Tshudi, who took pleasure in mining. Higher up the Irtisch, as far as the Bukforma, mountains of schistus frequently appear, in which copper-ore is dug, and which is, here and there, under-run by porphyry and granite, but in many places covered with chalk. The mountains in which are the sources of the Ouba consist of granite, porphyry, marlstone, petrosilex, and quartz. Towards the east the Oubinskoi mountains rear their lofty summits, which, measured with the line, were found to be 5691 English feet above the water of the river Ouba, which devolves its pleasant streams beneath their monstrous cliffs. In these mountains have been lately found the Filipotskoi mines, on the Ulba, which promise great success, together with other mines. Tooke's Russ. vol. i.

OUCARRA, a town of Hindoostan, in the Mysore; 5 miles S. of Sattimulgum.

OUCENTA, a town of Naples, in Lavoura; 12 miles E. of Capua.

OUCH, in our *Old Writers*, a collar of gold, or such like ornament, worn by women about their necks. Stat. 24 Hen. VIII. cap. 13.

OUCHE, in *Geography*, a town of Switzerland, on the lake of Geneva; which is the port of Lausanne.

OUCHTERMUCHTY, a borough town, situated in the county of Fife, Scotland, was constituted a royal borough by king James IV., and the charter was subsequently confirmed by James VI. This place still continues to enjoy all its original privileges, except the right of sending members to parliament, or to the convention of royal boroughs. The government

government is vested in three bailties and fifteen counsellors, who are elected annually; and there is a weekly market for provisions. A very considerable manufacture of brown linens and Silebias is carried on here, as are likewise some tan-works. The parish extends about two miles in length and one and a half in breadth, and displays much variety of surface. In the immediate vicinity of the town the soil is gravelly, but at a greater distance is fertile. Free-stone and marl are abundant. According to the parliamentary returns of 1811 the whole parish comprises 525 houses, and a population of 2403 persons. *Beauties of Scotland*, vol. iv.

ODAL, a town of Norway, in the province of Aggerhuus; 40 miles N.E. of Christiania.

ODAPOUR, a town of Bengal; 15 miles E. of Comillah.

ODATUM-ODOUC, a town of Chinese Tartary. N. lat. $45^{\circ} 9'$. E. long. $121^{\circ} 28'$.

OUDE, a province or foubah of Hindoostan, the dominions of which lie on both sides of the Ganges, occupying (with the exception of Fezoola Cawn's district of Rampour) all the flat country between that river and the northern mountains towards Thibet, as well as the principal part of the fertile tract lying between the Ganges and Jumnah, known by the name of Dooab, to within 40 miles of the city of Delhi. On the E. and S.E. it is bounded by Bahar, on the S. by Allahabad, ceded by treaty to the English in 1793, and on the W. by Agra. According to the statement of Major Rennell, in the Introduction to his *Memoir*, the dimensions of Oude, and its dependencies, may be reckoned 360 British miles in length from E. to W., and in breadth from 150 to 180; and their area is about one-third part of that of the Bengal provinces; being to each other in the proportion of 53 to 162. Generally speaking, the whole territory is one continued plain; and is a continuation of that extensive level valley through which the Ganges, and its branches, take their course. It is, moreover, the central part of the ancient kingdom or empire of the "Prasii." Lucknow, situated on the river Goomty, and about 650 miles from Calcutta, is its present capital; having superseded Fyzabad, a city on the Gogra, near the ancient city of Aiudh, which seems to have given name to the province. The nabob of Oude is in alliance with the British power: and a brigade of the Bengal army is constantly stationed on his western frontier; thus answering the purposes of covering Oude as well as Bengal, and of keeping the western states in awe. It is advanced about 100 miles beyond Lucknow. The whole expence of it is paid by the nabob of Oude, by a stipulated sum, under the name of a subsidy, amounting annually to 420,000*l.*, provided the Sicca rupee be valued at 2*s.* 1*½d.* The late nabob of Oude, Sujah Dowlah, possessed, at the time when he first became an ally of the East India company, the whole foubah of Oude, and the greatest part of Allahabad; to which, in 1774, were added the eastern parts of Delhi and Agra, till that time possessed by a tribe of Afghan Rohillas, and by the Jats. The Zemindary of Benares, which includes also the circars of Gazypour and Chunar, constituted a part of the dominions of Oude until the year 1775, when its tribute or quit-rent of 24 lacks (since increased to 40) was transferred to the English. This Zemindary, which was lately in the hands of Chut Sing, occupies the principal part of the space between Bahar and Oude, so that only a small part of the territory of the latter touches Bahar on the N.W. The revenues of Oude under Aurungzebe amounted to 80½ lacks of rupees; but they have more lately been reckoned in the gross amount at about 2½ millions sterling; of which the

new acquisitions of Rohilcund, Corah, and other parts of the Dooab, are more than one million. The military establishment, including the troops employed in the collection of the revenues, is from 50 to 60,000 men; but few of them deserve the name of regular troops.

The province of Oude is watered not only by the Ganges, but by the Jumnah, Agra, Goomty, and several smaller streams; these flow through most of the principal towns, and are navigable for boats in all seasons of the year. They present strong barriers against the neighbouring powers. Oude has seven circars, *viz.* Bahraitch, Canoge, Goorackpour, Kairabad, Lucknow, Manickpour, and Oude proper.

OUDE, a circar of Hindoostan, in the foubah of Oude, bounded on the N. by Bahraitch, on the E. by Goorackpour, on the S. by Jionpour and Manickpour, and on the W. by Lucknow; about 45 miles long and 16 broad. Its capital is Fyzabad.

OUDENARDE, a town of France, in the department of the Scheldt, and principal place of a district, situated on the Scheldt; supposed by some to have been built by the Goths in the year 411. It lies in a valley, on the side of a mountain called "Kerselaerberg," which defends the city. It has two parish churches, five gates, and many good buildings. The town has two jurisdictions; one of the magistracy, composed of a grand bailiff, a burgomaster, and nine echevins; the other in the hands of the lords: these jurisdictions are separated by the Scheldt. This town was so well fortified by Francis de la Nouë, a French Calvinist, that it was called "Little Rochelle." Oudenarde surrendered to the French on the 3d of July, 1794; 12 miles S. of Ghent.

OUDENBORG, a town of France, in the department of the Lys; six miles S.E. of Ostend.

OUDENBOSCH, a town of Brabant; 10 miles W. of Breda.

OUDERKERCK, a town of Holland; six miles S. of Amsterdam.

OUDEWATER, a town of Holland, seated on the Little Iffel, to which Henry de Vianen, bishop of Utrecht, gave the privileges of a city, in the year 1254. In 1575 it was taken by assault, pillaged and burnt by the Spaniards, who murdered, among many others, the mother, sisters, and brothers, of the celebrated James Arminius, who was born here in the year 1560; 20 miles S. of Amsterdam.

UDGAH, a town of Bengal; 54 miles S.E. of Doefa.

UDGASTEL, a town of Brabant; 12 miles W. of Breda.

UDIA, CAPE, or *Capoudia*, a cape on the E. coast of Tunis. N. lat. $30^{\circ} 45'$. E. long. $11^{\circ} 2'$.

UDIGHIR, a town of Hindoostan, in Dowlatabad; five miles N.W. of Beder.

UDIN, CASIMIR, in *Biography*, a learned French monk, in the seventeenth and eighteenth centuries, who afterwards embraced the Protestant religion, was born at Mesnières, on the Meuse, in the year 1638. He discovered an early inclination for learning, and after having gone through his course of rhetoric, at the age of eighteen he entered among the monks of the Premonstré order at the abbey of St. Paul at Verdun. Here he applied himself to the studies of the place, but in his future life he attached himself chiefly to ecclesiastical history, and made it a principal pursuit. In 1675 he entered holy orders, and was appointed incumbent of Epinay, in the diocese of Rouen. In 1677 he resigned this benefice, and was placed by his superiors in the abbey of Bucilly in Champagne. In the following year he was sent on a visit to all the abbeys and churches belonging

belonging to his order, for the purpose of selecting from their archives such documents as might assist him in his enquiries into ecclesiastical history. He first visited the monasteries in the Netherlands, whence he brought back with him a rich supply of materials, and in 1682 he made the same researches in the religious houses of Lorraine, Burgundy, and Alsace. In 1683 he was sent to Paris, where he formed connections with several eminent characters in the republic of letters, and in 1688 he published a work, by which he acquired great credit, entitled "*Supplementum de Scriptoribus vel Scriptis Ecclesiasticis à Bellarmino omisiss, ad annum 1460, vel ad artem typographicam inventum.*" In 1690 he found reason to change his religious sentiments and profession, withdrew from France and went to Leyden, where he renounced the popish creed, and made a public profession of the Protestant religion. Soon after this he was appointed sub-librarian of the university of Leyden, a post which he retained till his death in 1717. He was author of many other works, as "*Acta Beati Lucæ Abbatis Cuissiacensis*;" "*Veterum aliquot Gallæ et Belgii Scriptorum opuscula sacra numquam edita*;" "*Epistola de ratione Studiorum suorum*;" and several others: but his principal work was entitled "*Commentarius de Scriptoribus Ecclesiæ Antiquis, illorumque Scriptis; adhuc extantibus in celebrioribus Europæ Bibliothecis, à Bellarmino, Poffevino, Phil. Labbeo, Guil. Caveo, El du Pin, &c.*" in three volumes, folio.

UDIN, FRANCIS, a learned French Jesuit, was born at Vignorix, in Champagne, in the year 1673. He was sent very young to commence his studies at Langres, where he made a considerable progress in his acquaintance with the sciences and the belles lettres. He resolved to embrace the ecclesiastical profession, and commenced his noviciate among the Jesuits, at Nancy, in 1691. He afterwards became professor of rhetoric at the college of Dijon, and then undertook the professorship of theology, the duties of which he performed with high reputation during fifteen years. He died at Dijon in 1752, at the age of seventy-nine. He was a good linguist; was profoundly skilled in the knowledge of sacred and profane antiquities, and in the science of medals. He was also distinguished by his taste in polite literature, and had a wonderful facility in composing Latin verses. He was author of many "Poems," "Odes," "Elegies," "Hymns," &c. of which the greater part was inserted in a collection entitled "*Poemata didascalica*," in three volumes, 12mo. His prose works were numerous, consisting of "Dissertations," "Eulogies," "Lives," &c.: and also of Commentaries on many parts of the scriptures. He was, towards the close of life, employed by his superiors on a continuation of the "*Bibliotheca Scriptorum Societatis Jesu*," which was begun by father Ribadeneira. Moreri.

UDINET, MARCII ANTONY, a medalist, was born at Rheims in 1643; he was professor of the law at his native place, and afterwards obtained the office of keeper of the royal cabinet of medals. He was also a member of the Academy of Inscriptions, and died in 1712. He wrote three memoirs on medals.

UDIPOUR, MEYWAR, or *Midwar*, in *Geography*, a province of Hindoostan, belonging to the Rajpoots, about 100 miles long, and about as much in breadth, situated on the E. of the river Puddah. In former times, it is probable that the whole Rajpootana constituted one kingdom or empire under the rajah or prince of Oudipour, who has always been considered as the head of the Rajpoot states. In modern times this rajah seems to have been regarded much like the general of the Amphictyons in Greece. Oudipour is very mountainous, with a sandy soil in the vallies. Its revenue in the

year 1779 was estimated at 10 lacks of rupees *per annum*.—Also, the capital of the circar to which it gives name, in the country of Agimere; 120 miles S.S.W. of Agimere. N. lat. 24° 42'. E. long. 74° 42'.

ODOBO, a country of Africa, subject to Benin.

OUE, a mountain of Persia, in Khorasan; eight miles E. of Kain.

OUEI-LO, a town of Thibet; 295 miles S.W. of Hami.

OUEI-NING, a city of China, of the first rank, in Koei-tcheou. N. lat. 26° 45'. E. long. 103° 50'.

OUEI-YUEN, a town of Thibet; 275 miles E.S.E. of Hami.

OUEI-YUEN *Holun*, a town of Corea; 450 miles E.N.E. of Peking.

OUE-KIUM, a town of China, of the first rank, in Honan, on the river Ki; 297 miles S.S.W. of Peking.

OVELGUNN, a town of the duchy of Holstein; nine miles E.S.E. of Eutyn.

OVELGUNNE, or OVELGOENNE, a town of Germany, and chief place of a small territory, which, in 1653, was annexed to the comté of Oldenburg; 16 miles N.E. of Oldenburg.

OVELTY. See OWELTY.

OVEN, or *Assaying OVEN*, in *Metallurgy*, is the particular sort of furnace used by the assayers in their operations on metals. See *Assaying FURNACE*.

OUEI-TCHEOU, in *Geography*, a city of China, of the first rank, in Tche-kian, on a river with a good harbour, not far from the sea; 765 miles S.E. of Peking. N. lat. 28° 1'. E. long. 120° 29'.

OUEI-TCHUEN, a town of Corea; 85 miles N.E. of King-ki-tao.

OUEI-Y, a town of Corea; 20 miles S.S.W. of Outecheou.

OUEI-YEN, a town of Corea; 33 miles S.S.W. of Outecheou.

OUEPAS, a town of Mexico, on the coast of Costa Rica, S. of Carthago.

OVERA. See AWERRI.

OVERACKEN, a small island on the W. side of the gulf of Bothnia. N. lat. 63° 50'. E. long. 20° 29'.

OVERALL, JOHN, in *Biography*, a learned prelate of the church of England, was born about the year 1559. From the grammar-school he was sent to St. John's college, in the university of Cambridge, of which society he was elected a scholar; after this he removed to Trinity college, where he was chosen a fellow. In the year 1596 he was nominated Regius professor of divinity, and took the degree of doctor in that faculty. About the same time he was elected master of Catherine-hall, and soon after was promoted to the deanery of St. Paul's, London. On the accession of James I. he was chosen prolocutor of the lower house of convocation, and in 1612 he was appointed one of the first governors of the Charter-house, then just founded. In 1614 he was nominated to the see of Litchfield and Coventry, from which, in four years, he was translated to that of Norwich, where he died in 1619, at the age of about sixty. He particularly excelled in scholastic theology; and declared himself without hesitation in favour of Arminianism. He is chiefly known as the author of a work entitled "*The Convocation-Book*," to which Dr. (afterwards bishop) Sherlock, attributed his conversion from nonjuring principles. See *Biog. Brit.* notes to the article SHERLOCK.

OVER-BLOW, in *Sea Language*. They say it overblows when the wind blows so very hard that the ship can bear no top-fails.

OVER-

OVER-BOARD denotes the state of being thrown out of a ship or boat into the water on which she swims; also the act of falling from such a vessel into the sea, &c. as the ship sprung a-leak, and obliged us to throw the guns over-board; or, a heavy sea broke over the deck, and carried two of our men over-board.

OVERBURY, Sir THOMAS, in *Biography*, an English gentleman, was descended from an ancient family at Ashton-under-Edge, in Gloucestershire. He was born in 1581, at the house of a maternal relation in Warwickshire, and after having laid the foundation of his grammar learning in that country, he was entered as a gentleman commoner of Queen's college, Oxford. From this place he removed to the Middle Temple for the study of the law, to which profession his father belonged, but not having a taste for legal pursuits he endeavoured to push his fortune at court. About the year 1604 he contracted an intimacy with Robert Carr, the favourite of king James (see the article JAMES I.), who was afterwards created earl of Somerset, and by whose means Mr. Overbury was knighted, and his father raised to the honour of being a Welsh judge. This was in the year 1608, and in the following year Sir Thomas made a tour on the continent, and on his return published "Observations on what he had seen." It was not likely that his principles should be pure while connected with a licentious court; and accordingly it appears that he assisted his friend and patron Carr, then lord Rochester, in his amorous correspondence with the countess of Essex, but after her divorce, he earnestly opposed the marriage of the two adulterers, for which he incurred the hatred of them both. An attempt was now made to remove Sir Thomas to a distance from the court by appointing him to a foreign embassy, but he refused compliance; and upon the ground of his refusal to undertake the king's service he was committed to the Tower in April 1612, and all access of his friends was denied him. Carr not only prevented the effect of every application for Overbury's release, but is said, by his own warrant, to have continued the strictness of his imprisonment, contrary to the usual practice in such cases. By his procurement, and that of his countess, poison was administered to him while a prisoner, and he died in extreme torture on the 15th of September 1613. Two years afterwards the circumstance of Overbury's death was discovered, the accomplices in the horrid murder were tried, and the lieutenant of the Tower, with several others, were condemned and executed. Carr and the lady, at that time the earl and countess of Somerset, were also convicted and condemned, but were pardoned. Sir Thomas, though by no means a blameless character, was lamented as a victim to the passions of a most abandoned pair. He was author of several pieces in prose and verse. The poem entitled "The Wife," describing the character of a woman qualified to render the marriage state happy, was extremely popular. The tenth edition of his works was published in 8vo. in 1753. *Biog. Britannica*. In this work there is a long and very detailed account of the methods used to destroy Sir Thomas Overbury.

OVER-CAST-STAFF, is a scale or measure, used by shipwrights, to determine the difference between the curves of those timbers which are placed near the greatest breadth, and those which are situated near the extremities of the keel, where the floor rises and grows narrower.

OVER-DONE, in the *Manege*, in French, *outré*. A horse is said to be over-done, or *outré*, when his wind and strength are broke and exhausted with fatigue.

OVER-FALL, or **TUMBLING-BAY**, in *Geography*, is a part of the side of a canal, or reservoir, over which the water runs away, or escapes, when it is too high.—Also, the

upper gates or sluices of opening weirs are called *over-falls*.

OVERFLAKEE, **OVER-FLACQUEE**, or *Zuidvorn*, an island of Holland, on the Meuse, about 13 miles long from E. to W., and four in its greatest breadth. The first name it derived from a sand-bank, called "Flacque" or "Flakee," which lies in the stream N. of the island, and the last from its situation with respect to the isle of Voorn, from which it is about two miles distant to the south. N. lat. 51° 43'. E. long. 4° 24'.

OVERFLAX, a town of Sweden, in the government of Wafä; six miles N. of Wafä.

OVER-FLOWING, or **INUNDATION of Land**. See *IRRIGATION*, *Flooding of LAND*, and *WATERING of Land*.

OVER-GROWN, in *Sea Language*. When the waves of the sea grow high, the sailors call it *rough sea*; but when the furies and billows grow vastly high, then it is an *over-grown sea*.

OVER-HANGING, in *Ship Building*, projecting over; as the stern is said to overhang when it rakes much.

OVER-HAUL, in *Sea Language*. A rope is said to be over-hauled, when drawn too stiff, or hauled the contrary way.

OVER-HAUL the Runner. See *RUNNER*.

OVER-HAUL the Sheet. See *SHEET*.

OVER-HAULING denotes the act of opening and extending the several parts of a tackle, or other assemblages of ropes, communicating with blocks or dead-eyes. It is used to remove those blocks to a sufficient distance from each other, that they may be again placed in a state of action, so as to produce the effect required.

OVER-HAULING is also vulgarly expressed of an examination or inspection into the condition of a person or thing.

OVERISSEL, in *Geography*, a department of Holland, which was one of the seven united Dutch states, bounded on the N. by Groningen and Freisland, on the E. by the bishopric of Munster and county of Bentheim, on the S. by Guelderland, and on the W. by the Zuyder See. The soil, except towards the W., where are some corn-lands and pastures, is generally marshy and productive of heath; the land is mostly common without inclosure, and without ascertained property. Near the river, however, are some inclosed meadows, which yield good hay. The whole country is flat and low, excepting merely a ridge which runs through it from N. to S. It is divided into three districts, *viz.* Salland, Twent, and Vollenhoven; to which may be added Drent dependent upon it. The principal towns are Deventer, Campen, Zwol, and Vollenhoven, with Affen and Co-vorden in Drent. The chief rivers are the Issel and Vecht.

OVER-LAND FARM, in *Agriculture*, a provincial word used to signify a parcel of land without a house to it.

OVER-LAUNCH, in *Ship Building*, to run the butt of one plank to a certain distance beyond the next butt above or beneath it, in order to make stronger work.

OVER-LAYING of Children, may be prevented by a machine called *arcuccio*.

OVER-MASTED, in *Sea Language*, denotes the state of a ship, whose masts are too high, or too heavy for the weight of her hull to counterbalance.

OVER-RAKE. When a ship, riding at anchor, so over-beats herself into a head-sea, that she is washed by the waves breaking in upon her; they say, the waves over-rake her.

OVER-REACH, in the *Manege*, is when a horse strikes his hind-feet against his fore. The

The word is also used for a strain, or painful swelling, of the master-sinew of a horse; occasioned by such over-reach.

OVER-RIDE, the same with over-done.

OVER-RULING *an Objection*, in *Law*, is the rejecting or setting it aside by the court.

OVER-RUNNING, among *Printers*. See *PRINTING*, and *CORRECTION*.

OVERSAMNESS, an ancient fine or penalty, imposed before the statute of hue and cry, on such persons, as, hearing of a robbery or murder, did not pursue the malefactor.

OVERSEERS *of the Poor*, are public officers, who must be substantial householders, (under which relative term day-labourers may be comprehended, if there be no other person to serve, and they must be generally resident in the parish,) created by the stat. 43 Eliz. cap. 2. and nominated yearly in Easter week, or within one month after Easter (though a subsequent nomination will be valid) under the hand and seal of two or more justices of the peace in the same county, and dwelling in or near the parish whereof one to be of the quorum, who must meet together for this purpose; to provide for the poor of every parish; and are sometimes two, or three, or four, according to the largeness of the parish: but not more than four nor less than two can be appointed. By 17 Geo. II. c. 38. in every township or place where are no churchwardens, the overseers alone may act in all respects as churchwardens and overseers may do in other places by virtue of this or any former act; and if any overseer shall die, or remove, or become insolvent, before the expiration of his office, two justices (on oath thereof made) may appoint another in his stead; and if in any place there shall be no such nomination of overseers, as is before appointed, every justice of the division shall forfeit 5*l.* to the poor of such place, to be levied by the churchwardens and overseers, or one of them, by distress by warrant from the sessions. (43 Eliz. c. 2.) This forfeiture supposes that the justices are obliged to divide, for in that case the appointment was to be by the justices in or near the division, and not otherwise; but now the justices at large are all equally concerned; and therefore it seems, that this penalty cannot be levied on any particular justice. But if, in any place, no overseer shall be appointed, a mandamus will go to the justices at large, to compel them to appoint. Parishioners, as well as overseers appointed, may appeal to the sessions against the appointment. (17 Geo. II.) Overseers refusing to take the office may be indicted for it; nor will the court quash an indictment against an overseer. The overseers thus appointed, and taking upon them the office, shall, within fourteen days, receive the books of assessment and accounts from their predecessors, and what money and materials shall be in their hands, and reimburse them their arrears. 17 G. II. cap. 28.

Their office and duty, according to stat. 43 Eliz. are principally these: first, to raise competent sums for the necessary relief of the poor, impotent, old, and blind, and such as are not able to work; and, secondly, to provide for such as are able, and such as cannot otherwise get employment: but this latter part of their duty, which, according to the wise regulations of that salutary statute, should go hand in hand with the other, is now most shamefully neglected. However, for these joint purposes, they are empowered to make and levy rates upon the several inhabitants of the parish, by the same act of parliament, which has been farther enforced and explained by several subsequent statutes. (See *RATE*.) And by 17 Geo. II. cap. 38. if any per-

son shall be aggrieved by any thing done or committed by the churchwardens and overseers, or by any of his majesty's justices of the peace, he may, giving reasonable notice to the churchwardens or overseers, appeal to the next quarterly sessions, when the same shall be heard and finally determined: but if reasonable notice be not given, then they shall adjourn the appeal to the next quarter sessions; and the court may award reasonable costs to either party. By 43 Eliz. c. 2. the churchwardens and overseers shall, within four days after the end of their year, and other overseers nominated, make and yield up to two justices (1 Q.) a true and perfect account of all sums by them received, or rated and assessed and not received, and also of such stock as shall be in their hands, or in the hands of any of the poor to work, and of all other things concerning their office; and such sums of money as shall be in their hands shall pay and deliver over to their successors: And the subsequent churchwardens or overseers, by warrant from two such justices, may levy by distress and sale of the offender's goods the said sums or stock which shall be behind on any account to be made; and in defect of such distress, two such justices may commit him to the common gaol, there to remain without bail or mainprize, until payment of the said sum and stock: And also any such two justices may commit to the said prison every one of the said churchwardens and overseers, which shall refuse to account, there to remain, without bail or mainprize, until he have made a true account, and satisfied and paid so much as upon the said account shall be remaining in his hands.

And by the 17 G. II. c. 38. it is enacted as follows: The churchwardens and overseers shall yearly, within fourteen days after other overseers shall be appointed, deliver in to the succeeding overseers a just account in writing, fairly entered in a book to be kept for that purpose, and signed by them, of all sums by them received, or rated and not received; and also of all materials that shall be in their hands, or in the hands of any of the poor to be wrought, and of all money paid by such churchwardens and overseers so accounting, and of all other things concerning their office; and shall also pay and deliver over all sums of money and other things, which shall be in their hands, to the succeeding overseers; which account shall be verified by oath before one justice, who shall sign and attest the taking of the same at the foot of the account, without fee: and the said books shall be preserved by the churchwardens and overseers in some public or other place within the parish or township; and they shall permit any person assessed, or liable to be assessed, to inspect the same at all reasonable times, paying 6*d.* for such inspection; and shall, upon demand, give copies at the rate of 6*d.* for every three hundred words, and so in proportion. And if they shall refuse or neglect to make and yield up such account verified as aforesaid, within such time, or shall refuse or neglect to pay over the money and other things in their hands; any two justices may commit them to the common gaol, till they shall have given such account, or shall have paid and yielded up such money and other things in their hands as aforesaid.

And if any overseer shall remove, he shall, before his removal, deliver over to some churchwarden or other overseer his accounts verified as aforesaid, with all assessments, books, papers, money, and other things concerning his office; and if any overseer shall die, his executors or administrators shall, within 40 days after his decease, deliver over all things concerning his office to some churchwarden or other overseer, and shall pay out of the assets all money remaining due, which he received by virtue of his office, before any of his other debts are paid. 17 Geo. II. c. 38.

In case of an overseer becoming a bankrupt, the balance

of his account is not due till fourteen days after his year is expired.

Overseers, neglecting their duty, shall forfeit for every default 20s. to the poor, to be levied by distress, or be committed to the common gaol. (43 Eliz.) And by 17 Geo. II. any parish officer, neglecting to observe the directions of that act, shall forfeit on conviction, within two calendar months after the offence committed, a sum not exceeding 5l. nor less than 40s. to the poor, by distress. By 33 Geo. III. c. 55. neglect of duty or disobedience to any lawful warrant or order of any justice, by any overseer of the poor or other parish officer, upon complaint on oath, shall incur a fine, imposed by two justices at any special or petty sessions, not exceeding 40s., to be levied by distress, and applied to the use of the poor. Overseers are indemnified in the performance of their duty by 43 Eliz. 1. Jac. c. 5. and 21 Jac. c. 12. the benefit of which latter statute is extended by 26 Geo. II. c. 44.

Churchwardens by 43 Eliz. are called overseers of the poor, and they join with the overseers in making a poor rate, &c. But the churchwardens having distinct business of their own, usually leave the care of the poor to the overseers only; though anciently they were the sole overseers of the poor.

It seems not to have been determined whether a justice of the peace may be appointed overseer. But it appears to be a prevalent opinion, that the offices of justice of the peace and overseers of the poor are incompatible, because the accounts of the latter were subject to the controul of the former.

By 1 W. & M. c. 18. Dissenting teachers, qualifying themselves according to the Toleration act, are exempted from being chosen or appointed to serve as overseers. By 18 Geo. II. c. 15. freemen of the corporation of surgeons in London are also exempted; so is an alderman of London. The same is the case with respect to attorneys and practising barristers. It seems also that a clergyman is not liable to serve the office of overseer, even though he have no cure of souls. An officer of the customs is also exempted; and it is said, in Gibson's Codex, 215, that all peers of the realm, by reason of their dignity, all clergymen, by reason of their order, and all parliamentary men, by reason of their privilege, are exempted from the office of churchwardens. See POOR.

OVER-SET, or OVER-THROW, in the *Sea Language*. A ship is said to over-set when her keel turns upwards; which misfortune happens either by bearing too much sail, or by grounding her, so that she falls upon one side.

OVER-SWEAT, in *Agriculture*, a term sometimes applied to hay-stacks, when they sweat too much, so as to be liable to burn.

OVERT ACT, a term in *Law*, signifying an *open act*; or an act capable of being manifested and proved.

The word is formed from the French *ouvert*, *open*.

In which sense it is distinguished from an *intentional act*. See TREASON.

OVERT Market. See MARKET.

OVERT-Pound. See POUND.

OVERT-Word denotes a plain open word, not to be mistaken.

OVERTON, in *Geography*, a small market-town and parish in the hundred of Overton, Kingsclere-division, of the county of Southampton, England, is situated on the great western road, at the distance of three miles E.N.E. from Whitechurch, and fifty-four miles W.S.W. from the metropolis. It was formerly a borough, and sent two members to parliament, but lost this privilege by neglect. The market

day here is Monday, weekly, and there are three fairs during the year. The church is a neat building, seated on an eminence about a quarter of a mile from the centre of the town. This parish contains the tythings of Pollhampton, Quidhampton, and Southington; and is watered by a fine trout stream, which drives a silk mill, and several corn mills within the limits of the parish. Large quantities of malt are made here and in the adjoining villages. According to the population returns of 1811, the houses in this parish were computed at 231, and the inhabitants at 1178, in number.

OVERTURE, in *Music*, the symphony in theatres, which immediately precedes the drawing up the curtain. It used to be called in France an *entrée*, and rendered as spirited, imposing, and full of harmony, as possible. In Lock's English operas it is called a *curtain tune*.

French overtures, and indeed the first movements of those of Handel, were almost all in the style of Lulli. They move in a spasmodic and convulsive manner, bordering on bombast. Lulli's overtures have a slight fugue, always in triple time, after the opening, but no air. So that the overtures of Handel have no resemblance to those of Lulli but in the first movement; the second is almost always an excellent fugue terminated by a pleasing air in minuet, gavot, or jig time.

"There was a time when French overtures served as models for all Europe. Sixty years have not elapsed, (says Roufseau,) since overtures were sent for from France to place at the head of the Italian operas. I have even seen many ancient Italian operas in score, with an overture by Lulli at its head. The Italians like not to hear this at present, but such is the fact.

"Instrumental music having made an astonishing progress within these 40 years, (in 1768,) the old overtures made for performers not very well acquainted with the finger-board or the powers of their instrument, have been abandoned to the French, and they have continued to persevere in them in their pristine state, without change or innovation. The Italians, impatient to rush forward in the road to fame, emancipated themselves from gallic chains in music, however patiently they may have submitted to political chains since, and composed overtures upon a different plan, full of fire and spirit in the first movement; in the second generally a graceful and captivating *andante*, *fampre piano*, in which they display all the graces of a beautiful melody, &c.; lastly, a brilliant *allegro*, commonly in $\frac{3}{4}$. The overture of this tune only acted as a crier of the court to enjoin silence by an *oyez*, by the time the curtain rises, and the clattering of doors and struggle for places cease."

OVERTURE *du livre*, or *à livre ouvert*, Fr., on the opening the book, at sight; these are expressions applied to musical students, or performers, who read music with as much facility as a newspaper.

OVER-WORKED, in the *Manege*, is the same with over-done. It is called, in French, *estrassé*.

OVER-WROUGHT, in *Rural Economy*, a term applied to horses or other animals that are worked beyond their strength.

OVER-YEARS, a provincial word applied to such bullocks as are not finished in fattening at three years old when home-breeds, or the first winter after buying in; but kept through the following summer to be finished the next winter.

OVER-YSCHÉ, in *Geography*, a town of France, in the department of the Dyle, on the river Ysche; 10 miles S.E. of Brussels.

OUÉSSANT, or USHANT, an island in the Atlantic, belonging to France, about 10 miles in circumference, con-

taining several hamlets and a small port, defended by a castle, and about 700 inhabitants; about 12 miles from the continent. N. lat. 48° 29'. W. long. 5°.

OUGEIN, OOGUIN, or *Oojin*, as variously spelled by different writers, is a city of India, the capital of the Mahratta chief Dowlut Rao Sindiah, in the province of Malwa, his hereditary territory. See MALWA.

This city is in many respects very interesting, and our account of it will be somewhat particular, naturally dividing itself into a description of the modern city, and a notice of the catastrophe, which at a remote period befel the ancient metropolis of Malwa. The present city of Oujein is of an oblong form, about six miles in circumference, and surrounded by a stone wall with round towers. Within this space there is some waste ground, but the inhabited part occupies by far the greatest portion; it is much crowded with buildings, and is very populous. The houses are built partly of brick, partly of wood. Of the brick houses the frame is first constructed of wood, and the interstices filled up with brick. They are covered either with lime, tarras, or with tiles. The principal bazar or market is a spacious and regular street, paved with stone. The houses on each side are of two stories; the lower, to which you mount from the street by five or six steps, are mostly built of stone, and is taken up with shops; the upper, of brick or wood, serve for the habitations of the owners.

The most remarkable buildings are four mosques, erected by private individuals, and a great number of Hindoo temples. Of the latter the most considerable is a little way out of the town, at a place called Unk-pat, held in great veneration, as being that where Krishna and his brother received the rudiments of their education. Here is a stone tank, with steps leading down to the water's edge, said to be of great antiquity; but it has been of late years enclosed with a stone wall, and two temples have been erected within the inclosure. These temples are square, with pyramidal roofs. That on the right, as you enter the gate, contains the images of Rama, Lakshiman, and Sita, in white marble; and that on the left, those of Krishna and Radha, the first in black, the second in white marble. All these figures are well executed. An account of these mythological personages is given in this work under their respective names.

Sindiah's palace in the city is an extensive and sufficiently commodious house, but without any claim to magnificence; and it is so closely surrounded by other buildings, as to make but little appearance on the outside. Near it is a gate, the only remains of a fort, said to have been built soon after the overthrow of the ancient city, which affords a good specimen of the old Hindoo architecture.

Within the city, and near the eastern wall, is a hill of a considerable height, on the top of which is a Hindoo temple of Mahadeva, and adjoining to it the tomb of a Mussulman saint. This hill is conspicuous from a distance, and a spectator from the top of it commands an extensive prospect on every side. To the northward he sees, at the distance of four miles, the rude and massy structure of Kalideh, or Calydeh, an ancient palace, built on an island in the river Sipparah, by a king of the family of Gour. A description of this extraordinary fabric is inserted in the *Oriental Repertory*, vol. i. p. 266, from a letter of sir C. W. Malet, dated Oujein, 13th of April 1785. By an extract from a history of Malwa, or Malava, these buildings appear to have been constructed by, or in the reign of, sultan Nasir ud-deen Gilgee, who ascended the throne of Malava in the year of the Hegira 905 (A.D. 1500), and reigned eleven years. These singular buildings, we may judge from their name, were erected or consecrated to the honour of

Kali, consort of Mahadeva, (see those articles,) to whom the temple on the hill within the city appears above to be dedicated. These are two square buildings, each covered with a hemispherical cupola, and divided below into eight apartments, besides the space in the centre. The communication to the island is by a stone bridge over one of the branches into which the river Sipparah is here divided. Below the bridge are several apartments constructed on a level with the water; and the rocky bed of the river is cut into channels of various regular forms, such as circles, spirals, squares, &c. to which, in the dry season, the current is confined. Turning to the westward, the spectator, from the top of the hill above-mentioned, traces the winding course of the Sipparah through a fertile valley, where fields of corn and clumps of fruit trees intersecting, diversify the prospect, till his attention is arrested by the fort of Beiroun-gurh situated close on the opposite bank. It is about a quarter of a mile in length, surrounded by a rampart of earth, and contains an ancient temple, dedicated to the tutelary divinity of the place, whose name it bears. Beiroun-gurh means the fort of Beiroun, or Bheroo, a Mahratta pronunciation of Bhairava, the offspring of Mahadeva. In the Sanscrit language Bhairava means *tremendous*. Still farther up the stream, and nearly opposite to the middle of the town, are the gardens of two Mahratta nobles, containing the luxuries of nature with extensive artificial decorations. Beyond these, at the distance of half a mile from the river, is a grove of trees on a rising ground. It contains the tomb of a Mahomedan saint; and is remarkable for having been the scene of a bloody action, fought about the year 1762, between Sindiah and one of his rebellious officers, named Raghu, who marched to Oujein at the head of thirty thousand men to attack his sovereign with only five or six thousand. With this inequality the fight began on the plain near the tomb above-mentioned, but Sindiah was joined by a party of six thousand Gofains, (religious mendicants,) and a chance shot killing Raghu, the rebel party was wholly routed.

The prospect on this side is bounded by a ridge of hills, at the distance of about three miles. It runs N.N.E. and S.S.W. and is seven miles in length. These hills are chiefly composed of granite, and from them the stone employed in building is supplied; but they are covered with vegetable mould to a sufficient depth to admit of cultivation. To the S.W. is a wide avenue of trees, which terminates a course of two miles, at a temple of Ganefa, (a mythological son of Mahadeva, see POLLEAR,) surnamed Chintamun. It is visited by numerous processions at stated periods.

The south wall of Oujein is washed by the Sipparah, which here makes a sudden turning. This extremity of the city is called Jeyasing-poor, that is, the quarter of Jeyasing, and contains an observatory, built by the enlightened and liberal rajah of that name. He also built observatories at four other cities, viz. at Anbhcer, his own capital, (since named from him Jeynagar,) Matra, Benares, and Dehli. He published, in 1728, a set of astronomical tables, which, in compliment to the then reigning emperor, he entitled *Zij Mahomedshahy*. Of these five observatories, and the astronomical tables, and labours in that science, of this illustrious prince the rajah Jeyasing, (or more correctly Jayasingha,) a learned and very interesting account is given in vol. v. of the *Asiatic Researches*, by Dr. W. Hunter, from whose "Narrative of a Journey from Agra to Oujein," in vol. vi. of that work, this article is chiefly taken. See OBSERVATORY.

Turning to the left, we are presented with a different prospect.

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prospect. As far as the eye can reach is a level plain, which is only interrupted by a conical hillock, at the distance of three miles; beyond which is an extensive lake, that lies close on the road that leads to Bopal. On the right of the road, at the same place, is a park belonging to Sindiah, well stocked with deer.

The rajah Jeyfing held the city and territory of Oujein of the emperor, in quality of subahdar; but it soon after fell into the hands of the Mahrattas, and has belonged to the family of Sindiah for three generations (1813.) The district depending immediately on the city yields a revenue of five lacks of rupees (60,000*l.*) *per annum*, and comprehends 175 villages.

The officers of government are almost the only Mahratta inhabitants of Oujein. The bulk of the people, both Hindoos and Mussulmans, speak a dialect very little different from that of Agra and Dehli. The Mussulmans form a very considerable portion of the inhabitants, and of these the tribe of Bohrah amount to about 1500 families. This singular tribe forms a large society in most of the cities and large towns of Hindoostan and the Deccan. Surat is said to contain 6000 families. The head-quarters of the tribe are Burhanpoor, where their moulla or high priest resides. A younger brother of the moulla resides in Oujein. They exercise both a temporal and spiritual authority over their sect, which forms the most useful and industrious class of the inhabitants.

The soil in the vicinity of Oujein, and indeed over the greatest part of the province of Malwa, is a black vegetable mould, which, in the rainy season, becomes so soft, that travelling is hardly practicable. On drying, it cracks in all directions, and the fissures are so wide and deep in many parts by the road-side, that it is dangerous for a traveller to go off the beaten tract; as a horse, getting his foot into one of these fissures, endangers his own limbs, and the life of the rider. The quantity of rain that falls in ordinary seasons is so considerable, and the ground so retentive of moisture, that wells are rarely used for agricultural irrigation. A great part of the labour, incident to cultivation in other parts of India, is thus saved. But this very circumstance makes the suffering more severe, on a failure of the periodical rains: for the husbandman, accustomed to depend on the spontaneous bounty of heaven, is unprovided with wells, and is with difficulty brought to undertake the unusual labours of irrigation, especially as they must commence with digging the sources.

There are, as in Hindoostan, two harvests in Malwa; the first in March and April, the second in September and October. Wheat, pease, and various sorts of vetches, ripen in the first. Barley is not cultivated, nor rice, otherwise than in small detached low spots. Grapes are abundant. Oujein is first supplied from Burhanpoor, a very large and flourishing town, more than 100 miles to the southward.

By the time the Burhanpoor grapes are exhausted, in April, those of Oujein ripen, but are inferior to the former. The vines produce a second crop in the rainy season, but of an acidulous and much inferior grape. The other fruits are the mango, guava, plantain, melon, water melon, two species of annona (squamosa and reticulata), several varieties of oranges and limes, the falfah (*Grewia asiatica*), from which is made a most refreshing sherbet, slightly acidulous.

The principal articles of export trade are cotton, which is sent in large quantities to Guzerat for the Bombay and China market, coarse printed cloths, and opium. From Bombay, through Surat, are received various kinds of Europe and China goods, many of which are sometimes to

be purchased cheaper in Oujein than in the English settlements; also pearls, which are partly used here, and partly forwarded to Hindoostan. Afacetida, which is produced in Sind and provinces beyond it, comes hither on its way to the eastward, to Mirzapoor, &c.; and diamonds, from Bundelcund to Surat.

The following observations on the weather at Oujein were made by Dr. Hunter in 1792. In the months of April and May, the winds in the day-time were strong and hot; the thermometer exposed to them being from 93° to 109°, at P.M. These winds, with little deviation, come from the westward. The heat at 9 P.M. varied from 80° to 90°. The mornings were more temperate, in one instance only rising so high as 81°, and sometimes being as low as 69°. From the 18th to the 25th of May, we had frequent squalls from the N.W. and W.N.W.; once from N.E., with thunder, lightning, and rain. The quantity of rain that fell in this time was about 10 inches. This weather is not usual at this season: it produced a temporary coolness; but the sky clearing up before the end of the month, the air returned to its former temperature, and even exceeded it, for the morning heat now sometimes rose to 85°.

On the 11th of June, the rains set in, and the quantity that fell during the season was as follows:

May, as above, about 10 inches, rained 5 days.		
June,	3.521	9
July,	12.071	22
August,	21.088	22
September,	5.651	9
	<hr/> 52.331	<hr/> 67

The rain terminated on the 14th of September. From the middle of June to the middle of July, the afternoon heat varied from 107° to 86°, gradually diminishing as the season advanced, and sometimes, from the continuance of the rain, was as low as 80°. The morning was more uniform; its extremes being between 87° and 77°; the evening between 90° and 75°. The weather during this period was constantly cloudy, sometimes hazy; wind uniformly from the westward, ranging from N.W. to S.W.

From the middle of July to the termination of the rains, the afternoon heat was from 89° to 74°. The limit between the two periods was strongly marked; July the 15th at P.M. being 91°, and on the next day, at the same time, 78°; the morning from 80° to 72°. During this period, the clouds were so heavy, and so uniformly spread over the face of the heavens, that the sun could seldom dart a ray through the gloom. The rain was frequent, and long continued, but seldom heavy. The only instance in which the rain of one day amounted to so much as three inches was between 7 P.M. of the 15th of August, and 9½ A.M. of the 16th. During this period of 26½ hours, the rain was incessant, and the quantity amounted to 10.128 inches. It then abated, but did not cease till the 17th, at 4 P.M.: the quantity in that interval was 0.629. So great a fall of water caused a destructive inundation. The waters continued to rise till the 16th at midnight, and then gradually subsided; but it was several days before the river was fordable by men or horses.

During the rainy season, the prevailing wind is westerly, ranging from N.W. to S.W.; a few times light winds from the S. and from the E.

After the rains were over (14th September), the sky cleared up, and the mid-day and afternoon heat increased. By the 23d, it was 92°; October 1st, 101°; and till the middle of November, was seldom under 90°. The morn-

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ing heat, during that period, gradually decreased from 73° to 46° ; the evening from 79° to 57° . The dew latterly very heavy.

The winds continued for two days (14th and 15th Sept.) at W. To the end of the month calm, or light airs from the N.E. To the middle of October, winds of moderate force from the N.W. prevailed; but with frequent calms. N.E. to the end of the month, with hazy mornings. All October there was not a cloudy day. In November, till the 6th, westerly was the reigning wind; to the 15th the N.E. recovered its prevalence; to the 8th the days were hazy; on the 4th a little rain fell. For the next week the sky was clear. At this time this accurate observer (Dr. Hunter) was seized with a fever, which suspended his meteorological remarks till the 1st of February. All he could notice was stormy weather about the middle of December, with thunder and a pretty heavy fall of rain.

From the 1st of February to the 14th of March, when Dr. Hunter left Oujein, the afternoon heat varied between 73° and 103° . The first on the 9th February with wind at N.N.W.; the highest 12th March, wind W. sky at both times clear. Morning heat from 46° to 67° ; evening from 55° to 76° .

The westerly were the prevailing winds during this period, ranging from N.N.W. to S.S.W. In February an easterly wind was observed twice in the morning, four times at mid-day, and twice in the evening. It did not occur again to the 14th of March. A small shower of rain fell on the 4th of February, and this was the only cloudy day during the period in question.

The foregoing abstract gives a pretty clear idea of the weather at Oujein for a year. But we are cautioned by the author of it not to consider it as an exact estimate of the weather usually experienced there. The quantity of rain, in particular, he represents as far exceeding the usual fall. On this we have to observe, that although for a day and night, as particularly mentioned, the fall was, indeed, excessive, yet for the whole period of the rainy season, we do not consider the depth given as any *very* excessive or unusual fall. This we say on the authority of some meteorological journals in MS. to which we have had access, and with which we have compared Dr. Hunter's. The degree of extreme heat, too, is greater than we have noticed elsewhere, in the western parts of India in the rainy season. Making some abatement on these two items (the fall of water and the extreme of heat), we are disposed to think the above a fair specimen of the climate of the western parts of India above the Ghauts, from Oujein to Seringapatam. It must be recollected, however, that the rains usually set in about a month earlier in the southern, than in the northern parts of that range. Fevers, chiefly intermittent, prevailed at Oujein toward the end of the rains, and increased in frequency till the middle of November. These were imputed to local and temporary causes; and the only endemic observed by Dr. Hunter, was the dracunculus, or Guinea worm.

The situation of this city is of importance, as it is considered as the first meridian by Hindoo geographers and astronomers. (See LANKA.) By the medium of eleven observations of Jupiter's first and second satellites, Dr. Hunter determined its long. to be $75^{\circ} 51' E.$ from Greenwich. Its lat. by a med. of eight obs. he made $23^{\circ} 11' 13'' N.$ It may be roundly reckoned about 300 miles N.E. from Surat, something more south from Agra. Indore, the capital of the Mahratta family of Holkar, is about 20 miles in a southerly direction, and Bopal (properly Bhupala) about 100 to the eastward. The last named is a flourishing

town and district, ruled by a Mahomedan government and dynasty, in a manner apparently more independent of the Mahrattas, than is usual in towns or districts similarly situated. We shall conclude this lengthened account of the modern city of Oujein, by observing, that during the military operations carried on under the administration of the marquis Wellesley, against the Mahratta confederates, the Bombay army, under general sir John Murray, took possession of both Indore and Oujein. But although we retained the latter city for some months, we have not heard of any literary result from our possessing so curious and interesting a spot. It seems to be within the reach of the literary societies both of Calcutta and Bombay, and considering our extended connection and intercourse with the Durbar, and country of Dowlut Rao Sindiah, a reasonable hope may be entertained of due notice being attracted to a spot promising so abundant a recompence to well-directed enquiry and research.

The ancient city of Oujein was situated about a mile to the northward, and now lies, and has for many centuries lain, buried in the earth to the depth of from fifteen to eighteen feet. On digging, its walls are said to be found entire, pillars erect and unbroken, pieces of wood of extraordinary hardness, &c. The bricks thus dug up are now applied to the purposes of building, but are much larger than any made in the present or late ages. Utensils of various kinds have been found, and ancient coins. Very little, however, has been yet done towards developing the present state of this submerged city; the interesting Herculaneum of India. Dr. Hunter noticed a large quantity of wheat that was found while he was there; it was in a charred state; a potter's kiln he also saw, filled with broken earthen vessels. Tradition imputes the destruction of the city to a shower of earth, an idea likely to have originated in superficial observation; for although Dr. Hunter observed no volcanic hills, nor scoria, in the neighbourhood, and thinks the state and position of the walls and pillars militate against the supposition of an earthquake having effected the submersion of the city, it is here difficult to impute it to any other than a volcanic cause, operating, perhaps, with less violence and convulsion than have attended similar phenomena in other countries, and combined with, or rather causing, an inundation of the river. A change in the course of the river is said to have taken place at the time, and an ancient bed is now traceable. A destructive inundation was witnessed and recorded by Dr. Hunter; and the writer of this article knows of another that occurred in a late rainy season. It would appear that the neighbourhood of Oujein is particularly subject to inundation, and when the loose friable nature of the soil be considered, it seems most reasonable to resort to an alluvial hypothesis to account for the submersion of the ancient city. But whatever may have been the real cause of the catastrophe, it cannot be supposed that the wild fancies of Hindoo historians would suffer the fact to be simply told. It must be dressed up in a mythological allegory. In fable or fact the interventions of the gods cannot be dispensed with. The following story is accordingly related.

A certain Gandharva, or celestial chorister, was condemned for an affront to the god Indra, to be born on earth in the shape of an afs; but on entreaty the sentence was mitigated, and he was allowed at night to assume the form and functions of a man. This incarnation took place at Oujein in the reign of rajah Sadafvasena, whose daughter was demanded in marriage by the afs; and his consent was obtained, on learning the divine origin of his intended son-in-law, confirmed, as he witnessed, by certain prodigies. Ali day he lived in the stables like an afs; at night, secretly slipping out of his skin,

skin, and assuming the appearance of a handsome and accomplished young prince, he repaired to the palace, and enjoyed the conversation of his beauteous and happy bride.

In due time the princess became pregnant; and her chastity being suspected, she revealed to her inquisitive parents the mystery of her spouse's delectable nocturnal metamorphosis; which the rajah, (or by other accounts the mother,) being conveniently concealed, himself beheld; and unwilling that his son should return to his uncouth disguise, set fire to, and consumed, the vacant asses' skin.

Rejoiced at his release, for this event appears to have broken the spell, the incarnate Gandharva warned his beloved wife to quit the city, which he foresaw was about to be overwhelmed with a shower of earth from the resentment of Indra, thus disappointed of his vengeance in the termination of the banishment of his insolent servant. She fled accordingly to a village at a safe distance, and brought forth a son named Vikramaditya; and a shower of cold earth, poured down by Indra, buried the city and its inhabitants.

It may be here noticed that this fable, wild as it is, affords still some confirmation of the supposition of an inundation during the rainy season having destroyed the city. For Indra is the god of showers, and such an event would of course be attributed to the vengeance of the Jupiter Pluvius of the Hindoo Pantheon, in the same manner as we frequently find the case in the natural phenomena mythologized in the Iliad. See INDRA.

The seeming fable has, also, another feature of historic truth; for Vikramaditya, so distinguished in his origin and birth, is no less so as a monarch and an astronomer. His name marks an era much used all over India, of which the 1866th year corresponds with 1813 of our's. Several monarchs of Malwa of this name are however recorded; and differences of opinion exist on some chronological points connected with this era. (See *As. Ref.* vol. ix. art. iii.) The Vikrama in question is, however, particularly distinguished by the surname of his putative parent, who is called Gardha-rupa, or the ass-faced, and his era is hence to be ascertained with more accuracy than is usually obtainable on remote points of Hindoo chronology. He was the third Vikramaditya, and appears, by several historical coincidences, to have ascended the throne of Malwa in the year of Christ 441. It hence appears that the city sunk about 1400 years ago. The story of the ass, variously modified, is widely spread in the popular tales of India, Persia, Turkey, Arabia, and other oriental countries, and has found its way even into the literature and legends of Europe.

The classical name of this city is Ujjaini, not materially altered in its present designations. It is also called Avantī in the Puranas, is much venerated by the Hindoos, and is one of the most celebrated for producing great and learned men among the cities of India. If Benares has been thought to deserve the name of the Athens, Oujein may lay claim to the honour of being the Florence of Hindoostan. From this circumstance we have been induced to be more diffuse than is usual with us in like cases, in our account of this city, which, and the legends connected with it, furnish ample subjects for the descriptive and fabulous details of Puranic romance. From this source we shall notice one more tale, or rather a variation of that already given, accounting for one of the ancient names of the city; premising, however, that such tales being found in the Puranas, fully prove those books, a portion of them at least, to have been written subsequent to the catastrophe that they describe. See PURANA.

The varied legend to which we advert, says that the curse

having expired in the consumption of his assine disguise, the Gandharva ascended to the heaven of Indra; and that his wife, resolving to die, ripped open her belly, took out the child, and gave it to a *malini* (gardener's wife) to nurse. She took it to Ujjaini, and from the signal preservation of the child in that city, it obtained the name of Avantī, from the Sanscrit *ava*, to preserve. Krishna is stated to have been educated, and his friend Narada to have been born, in Avantipurī.

The city of Oujein appears evidently, both as to name and position, in the Periplus of the Erythrean sea, as well as in Ptolemy, under the name of "Ozena."

OUGHTER LOUGH, a lake of the county of Cavan, Ireland, formed by an expansion of the river Erne, which flows through it. The irregularity of its form, the large and beautiful islands it contains, and the many deep recesses that wind between high banks and overhanging woods, produce a rich variety of interesting and romantic scenery. It was in a small island in this lake that good bishop Bedel was confined by the insurgents in the seventeenth century. Beaufort.

OUGHTERARD, a small post-town of Ireland, in the county of Galway, situated on lough Corrib. The rocks here are of black and white marble. It is 120 miles W. by N. from Dublin, and nearly 14 miles N.W. from Galway.

OUGHTRED, WILLIAM, in *Biography*, an eminent mathematician, was born at Eton, in Buckinghamshire, about the year 1573. He was educated in grammar learning upon the foundation of that school, and was thence elected, in 1592, to King's college, Cambridge, of which he was afterwards admitted a fellow. Here he applied himself with great assiduity to the study of different branches of academical learning, and particularly that of mathematics. While an under-graduate, he invented "An easy method of geometrical dialling," which was not published before the year 1647, but was privately received with so much esteem, that Mr. (afterwards sir Christopher) Wren, at that time a scholar of Wadham college in Oxford, immediately translated it into the Latin language. In 1596 Mr. Oughtred was admitted to the degree of B.A., and in 1599 to that of M.A. About the year 1603 he was ordained priest, and presented with the rectory of Aldbury, near Guilford, in Surrey, upon which he quitted the university, and resided upon his living, distinguishing himself by the faithful and diligent discharge of his pastoral duties. Here he led a retired and studious life, seldom travelling so far as the metropolis, his principal recreation consisting in a diversity of studies. So high was his reputation for mathematical knowledge, that he obtained what number of pupils he pleased, and many of the chief mathematicians of that age owed much of their skill to him. He also maintained a correspondence with some of the most eminent scholars of his time on mathematical subjects. In the year 1614, Mr. Briggs, professor of geometry, having met with lord Neper's account of the invention of logarithms, and desirous to perfect the plan, consulted Mr. Oughtred upon the subject, who probably wrote his treatise "On Trigonometry" about this time, though it was not published till 1657. In prosecuting the same subject, he invented, not many years afterwards, an instrument called "The Circles of Proportion," by which all such questions in arithmetic, geometry, astronomy, and navigation, as depended upon simple and compound proportion, might be worked; and it was the first sliding-rule that was projected for those uses, as well as those of gauging. In 1628 Mr. Oughtred was engaged by the earl of Arundel to become mathematical tutor to his son lord William Howard, and

and he drew up for the use of his noble pupil "Arithmeticæ in numero et speciebus Institutio; quæ tum Logisticæ, tum Analyticæ atque adeo totius Mathematicæ quasi Clavis est," which he published in 1631. This work, which was intended by the author to serve as a general key to the mathematics, was very favourably received both at home and abroad. An English translation of it was published in 1647, under the title of "The Key of the Mathematics new forged and filed, &c." It went through several editions, and became a standard work with tutors in the instruction of mathematical pupils at the universities, and some parts of it were made the subjects of the geometrical lectures at Gresham college. In a third edition of his *Clavis*, he added a treatise on the use of logarithms; a declaration of the tenth book of Euclid's *Elements*; a treatise of regular solids, and the theorems contained in the books of Archimedes. He did not think it necessary, nor of any advantage to geometry, absolutely to confine the demonstrations, in the sublimer parts of science, to the principles laid down in the *Elements*. On the contrary, in his expositions of the theorems of Archimedes on the sphere and cylinder, he condemns the rigid strictness of that author, which obliged him to make use of arguments *ex absurdo*. These he rejected, and assuming for a postulat, that a circle is a plane, and a sphere a solid figure having an infinite number of sides, he gives, for the most part, affirmative and direct demonstrations of those theorems. Notwithstanding all his mathematical merit, he was in danger, about the year 1646, of a sequestration by the committee for plundered ministers, several articles having been deposed and sworn against him; but upon the day of hearing, William Lilly, the famous astrologer, applied to all his friends, who appeared in such numbers on his behalf, that though the chairman and many members were active against him, he was acquitted. He died in 1660, at the good old age of 86, and his death was said to have been occasioned by a sudden extacy of joy, upon hearing the vote which was passed at Westminster for the restoration of Charles II. He has been characterised "as facetious in Greek and Latin; as solid in arithmetic, astronomy, and the sphere of all measures, music, &c.; exact in his style, as in his judgment; handling his cube, and other instruments at eighty, as steadily as others at thirty; owing, he said, to temperance and archery; principling his people with plain and solid truths, as he did the world with great and useful arts; advancing new inventions in all things but religion, which, in its old order and decency, he maintained secure in his privacy, prudence, and contentment." He had a son, whom he put apprentice to a watchmaker, for whom he wrote a book of instructions in that art. He left behind him a great number of manuscripts upon mathematical subjects, and most of his Greek and Latin books contained notes in his own hand writing, with a demonstration of the propositions in the margin. These books and manuscripts came into the possession of Mr. William Jones, father of the late Sir William Jones, and afterwards into the hands of Sir Charles Scarborough, the physician, who carefully selected those that were fit for the press, and printed them in 1676, under the title of "*Opuscula mathematica hæctenus inedita*," 8vo. *Biog. Brit.*

OUGHLY, in *Geography*, a town of Hindoostan, in the circar of Sanore; 75 miles W. of Sanore.

OUQUELA, a town of Portugal, in the province of Alentejo; six miles S. of Albuquerque, in Spain. N. lat. $38^{\circ} 54'$. W. long. $6^{\circ} 43'$.

OUQUELA, a town of Africa, in the territory of Tripoli. See AGUILA.

OVI ALBUMEN. See ALBUMEN.

OVICULUM, in the *Ancient Architecture*, a little ovum, or egg.

Some also use the word *oviculum* for *ovolo*.

Baldus will have this to be the Lesbian astragal of Vitruvius. Daviler.

OVID, PUBLIUS OVIDIUS NASO, in *Biography*, a celebrated Roman poet, was born at Sulmo, the present Abruzzo, in the consulate of Hirtius and Pansa, in the year 43 B.C. He was of an ancient equestrian family, and was sent in his youth to Rome to be educated in liberal studies under the best masters: he shewed a propensity to poetry at an early period of his life, and it was not without extreme difficulty, that his father could prevail on him to relinquish the culture of the Muses for the thriving pursuits of the law. At length, however, he was prevailed on to set down to business, and he appears to have made good progress in forensic eloquence and judicial knowledge, for he refers to some causes that he had pleaded with great success; and he afterwards sat as one of the triumvirs to whom criminal jurisdiction was committed. By the death of his brother he was probably no longer obliged to follow the law as a gainful profession, deserted the courts, and gave himself up to pleasure and poetry. His talents and amiable qualities introduced him to the best society in Rome. He was married three times; from the first two wives he was divorced, but he speaks of his third, Perilla, with great affection, by whom he had a daughter, who adhered to him in all his fortunes, and who is thought to have survived him. He seems to have lived at his ease and in affluence, possessing a house near the capitol, and pleasant gardens on the Appian way, as well as a villa in his native country. A lively genius and a fertile imagination gained him many admirers; Virgil, Propertius, Tibullus, and Horace, honoured him with their correspondence, and Augustus patronised him with the most unbounded liberality. He had rendered himself famous by several poetical compositions, when, at about the age of fifty, he incurred a sentence of banishment, which was never revoked, and which made him an exile for the remainder of his life. The true cause of this circumstance has never been known. Few incidents in classical biography have more excited the discussion of the curious than this; still a mystery hangs upon it which no elucidation can thoroughly clear. He has himself assigned two reasons for the anger of Augustus; one, and that the ostensible cause, though certainly not the true reason, the licentiousness of his juvenile poems; the other, he says, was an error, not a crime, something of which his eyes had been guilty, not his intentions:

"Inscia quod crimen viderunt lumina plector,
Peccatumque oculos est habuisse meum."

And in another places he writes,

"Perdiderunt cum me duo crimina, carmen et error
Alterius facti culpa silenda mihi est."

It was something in which the emperor's feelings were particularly concerned; some attribute it to an amour of Ovid with Livia, the wife of Augustus, while others suppose it arose from the knowledge which the poet, involuntarily, had of the shocking incest of the emperor with his daughter Julia. The place of Ovid's exile was Tomi, a town in Scythia, near the Euxine sea, and not far from the mouths of the Danube. His elegiac epistles from that place are full of complaints of the severity of the climate, the wildness of the scenery, and the savage manners of the surrounding people. How long he lived in this condition is not certainly known; he was alive in the eighth year of his exile, which was two years after the death of Augustus. That

event had no effect in producing his recall, for Tiberius was either hostile or indifferent to him. He felt most bitterly this perpetual exclusion from cultivated life, and all the consolations of friendship and domestic affection, and does not affect a strength of mind which did not belong to his character. The Eusebian chronicle places his death in the fourth year of Tiberius, but the authority cannot be relied upon. The people of Tomi are said to have mourned publicly for him, and to have erected a stately monument to his memory without the walls of their city. Ovid was a copious writer, and the greater part of his works has come down to our times. Those which we possess are his "Heroical Epistles," composed in the characters of distinguished lovers in the heroical ages; his elegies entitled "Amorum," and books on the "Art of Love;" his fifteen books of "Metamorphoses;" his six books of "Fasti" on the Roman calendar, which are only half the number that he composed; his elegiac lamentations entitled "Tristitia," and "Epistolæ ex Ponto." Besides these there is his "Ibis," written in imitation of a poem of Callimachus of the same title, which is a satirical performance: there are also fragments of other poems, among these some of a tragedy entitled "Medea." The loss of half the "Fasti" is to be greatly regretted, as it is probable it contained much valuable and interesting information respecting the religious antiquities of the Romans. The tragedy of "Medea" was regarded as one of the best productions of the Roman theatre. On whatever he has written, he has totally exhausted the subject. He ever paints nature with a masterly hand, and gives strength to the most vulgar expressions. "There is no subject, which in his hands he does not turn into poetry, or, at least, into elegant verse. His vein is inexhaustible; and his principal faults arise from that superabundance of wit and fancy, which is apt to run him out of breath, while he chafes one thought or image after another. He abounds beyond any other ancient with points and turns of expression sometimes really beautiful and striking, often deviating into trifling puerility. In his happiest moods, he describes with wonderful force and vivacity; he is sometimes splendid and picturesque, sometimes elegantly chaste and simple. With all his tendency to superfluity, no one has exceeded him in the neat and energetic brevity with which he occasionally gives a moral sentiment, so that his works are an admirable store of mottoes and sentences. He is sometimes, though rarely, sublime, often brilliant, frequently pathetic, and almost always amusing. If he does not rank with the very first class of poets, he is certainly one of the most agreeable." The editions of the whole, and of detached parts of his works, have been extremely numerous. The following have been mentioned as among the most valuable of the whole works; that of Heinsius, Elzevir, 3 vols. 12mo. 1629; Burman's, Amst. 4 vols. 4to. 1727; and of Utrecht, 4 vols. 12mo. 1713; Wetstein's Amst. 3 vols. 12mo. 1751; Barbou's, Paris, 3 vols. 12mo. 1762; and Fischer's, Lipf. 4 vols. 8vo. 1773.

OID, in *Geography*, a post-town of New York, in Cayuga county, incorporated in 1794, and containing 2169 inhabitants.

OVIEDA, in *Botany*, received that name from Linnæus, in honour of Gonfálvo Ferdinando d'Oviedo, alias de Valde, a Spanish divine, who in the reign of Ferdinand V. was superintendent of the gold mines of South America, and resided at Santa Maria in Darien, of which he was rector. He wrote a history of the West Indies, containing an account of many American plants; which may be seen in the collection of Voyages, published by the Giunti, at Venice, in 1556, and which is taken from the Spanish edition,

printed at Toledo in 1526. Of this there are English, Italian, and French translations. Plumier, who first established the present genus, called it *Valdia*, which Linnæus properly corrected.—Linn. Gen. 325. Schreb. 425. Willd. Sp. Pl. v. 3. 381. Mart. Mil. Dict. v. 3. Juss. 211. Lamarck Illustr. t. 538. Gærtn. t. 57. (*Valdia*; Plum. Gen. 11. t. 24.)—Class and order, *Didynamia Angiospermia*. Nat. Ord. *Perfonatæ*, Linn. *Caprifolia*, rather *Vitices*, Juss.

Gen. Ch. Cal. Perianth inferior, of one leaf, bell-shaped, erect, in five short, broadish, acute, permanent segments. Cor. of one petal, ringent; tube extremely long, narrow, nearly cylindrical; limb short, in five (not three), nearly equal, obtuse segments. Stam. Filaments four, thread-shaped, longer than the corolla, incurved at the summit, two of them rather the longest; anthers roundish. Pist. Germen superior, globose; style thread-shaped, the length of the stamens; stigma in two acute segments. Peric. Berry nearly globose, four-lobed, of one cell, separable into four parts, standing upon the enlarged calyx. Seeds four, tumid on one side, angular on the other, of one cell.

Eff. Ch. Calyx five-cleft. Corolla with a very long cylindrical tube; limb five-cleft, nearly equal. Berry globose, with four seeds.

1. *O. spinosa*. Spinous, or West Indian, Ovieda. Linn. Sp. Pl. 888. Swartz Obs. 248. (*Valdia cardui folio*, fructu subcæruleo; Plum. Ic. 254. t. 256.)—Leaves elliptical, with spinous teeth.—Native of Hispaniola. Our specimen was gathered by Von Rohr in that island, near the town called *aux Cayes*, and communicated by sir Joseph Banks. Linnæus had never seen this plant, which is one of the rarest productions of the West Indies. The stem is shrubby, with rough branches. Leaves opposite, on short, round, downy footstalks, elliptical or obovate, acute, rigid, four or five inches long and two broad; smooth above; reticulated with numerous strong veins beneath; bordered with broad, unequal, spinous teeth. Panicle terminal, erect, corymbose, somewhat leafy, its stalks opposite, three-cleft, downy. Bractæas lanceolate, deciduous. Calyx hairy, with ten strong ribs, and five spinous, spreading, not very deep, teeth. Corolla three inches long, downy, apparently white with a purple tinge, or perhaps entirely purple when fresh, the limb in five, nearly equal, obtuse, spreading, downy-edged segments, each above half an inch long. Plumier says the segments are generally but three. His description of the insertion of the corolla upon an inner calyx, is unintelligible to us, and we presume he means that the globular base of the tube closely envelopes the germen. He describes the fruit as blueish; Swartz says it is black, ripening in May.

2. *O. mitis*. Smooth, or East Indian, Ovieda. Linn. Sp. Pl. 889. Burm. Ind. 136. t. 43. f. 1.—Leaves linear-lanceolate, wavy, entire.—Native of Java. A smooth and unarmed shrub. Leaves four in a whorl, nearly sessile, five or six inches long, not an inch wide, acute, entire, thick-edged, slightly wavy, smooth, with many curved interbranching veins. Stipulas awl-shaped, minute, within the footstalks. Panicle large, leafy, terminal, of numerous, three-forked, axillary and terminal, smooth branches. Bractæas lanceolate or linear, smooth. Calyx somewhat glutinous, unarmed. Corolla as long as the former species, rather downy upwards; its limb in five obtuse, concave, nearly equal segments, laterally overlapping each other in the bud. Their colour seems to be white or yellowish, with stains of red or purple. It is remarkable that Burmann represents the corolla of this with only three segments. Perhaps he saw but a bad dry specimen, and trusted to Plumier and Linnæus for the generic character. The leaves are whorled in Linnæus's own specimen, though he describes them

them as opposite, and has led some botanists to think the whorled plant a new species. *O. mitis* is the only species he ever saw, even in a dried state.

OVIEDO, ANDRES DE, in *Biography*, bishop of Hieropolis, and patriarch of Ethiopia, was born at Ilhecas, a town situated half way between Madrid and Toledo. He graduated at Alcalá, and then went to Rome, where, in the year 1541, he entered the society of Jesuits, then only in its infancy. When Joam III. founded the first Jesuit college at Coimbra, he, with eight Flemish companions, was sent to colonize it by Peter Faber. Oviedo soon distinguished himself by his devotion, his humility, and self-austerity, and was nominated rector of a college at Gandia. He was afterwards made rector of the college at Naples: in these situations he performed the duties required of him with exactness, and inflicted upon himself the most severe mortifications. "Thus far," says Mr. Southey, "his talents had been well employed; but when Loyola nominated him as coadjutor and successor to Joam Nunez Bareto in the Abyssinian mission, he mistook the character of Oviedo. A statesman was wanted, not a fanatic." He was consecrated bishop of Hieropolis, and with ostentatious humility he used to fetch water for the college. In 1556 he and Bareto set sail, and reached Goa in little more than four months. The affairs of Abyssinia at this time were in so unprosperous a state, that it was not thought expedient for the patriarch to proceed thither; he was therefore detained at Goa, while Oviedo, with his five companions, was sent forward on the mission. They landed at Arkeeko five days only before that fort was taken possession of by the Turks. On his way to court, Oviedo was welcomed by the Portuguese, and received with every mark of respect and honour: but he was outrageous against the reigning prince, who would not change his creed, and threatened to excommunicate all who remained in his service. He himself would have returned to India, but was persuaded by his countrymen, who were settled in Abyssinia, not to leave them. At length Oviedo and the other Jesuits excited a rebellion in the country, and though they were successful in their attempts to injure and harass the existing government, yet their stay in the country was thought so fruitless, that orders came from Rome for them to go to Japan. By the death of Bareto, Oviedo had now succeeded to the vain title of patriarch, but now he had no possible means of getting away from Abyssinia, and so completely destitute was he of all European conveniences, that the letter which he contrived to send to Rome was written upon slips of paper cut from the margin of his breviary. He lingered out the remainder of his days in obscurity, and died in 1577, having been twenty years employed in a mission, for which he was in no respect properly qualified. Gen. Biog.

OVIEDO, GONZALO FERNANDEZ DE, one of the earliest historians of the new world, was born at Madrid in 1478. He spent his youth about the court, and became page to Ferdinand king of Arragon, and Isabella queen of Castile. He accompanied Columbus on his first voyage to Hispaniola, where he resided many years, and wrote the "Historia General de las Indias," in fifty books. Twenty-one of these were printed at Seville in 1535, and at Salamanca in 1547. A summary of this work, which Oviedo drew up for the emperor Charles V., is inserted in Barcia's collection of the "Historiadores Primitivos de las Indias Occidentales." This summary contains the most decisive passage concerning the importation of "Syphillis" from America, that is any where to be found. He wrote two tracts concerning the "Palo de Guayacan," and the "Palo Santo," translations of which are in the first volumes of

his collection "*Scriptorum de Morbo Gallico*." The office of chronicler was given to him by Charles V. when he was in the seventieth year of his age. He left behind him many unpublished works, besides the sequel of his great history. Moreri. Gen. Biog.

OVIEDO, *Ovictum*, in *Geography*, an ancient town of Spain, the only city and the capital of the Asturia of its name. It is situated on a plain, rather elevated, at the confluence of the two little rivers Ovia or Ove, and Nora, the former of which runs into the Nora, and this into the Nalon, the first running to the N., and the second to the S. of Oviedo. Some, without sufficient authority, have made Oviedo the "*Lucus Asturum*;" others have deduced its name from the Ovia, after Froila, the grandson of Pelagius, had built it in 757; and according to others again, it was so considerable in the time of Pelagius, that after his first accession he made it the chief place of his states, and transferred to it the episcopal see of a neighbouring town called "*Emerita*." However this be, Oviedo, in the ninth century, was honoured throughout Christendom with the singular title of "*the city of bishops*," because a number of them, exiled and persecuted by the Saracens, took refuge in this place. In 901 a council was held here, and while it was convened, the bishopric was elevated into an archbishopric by the pope, which dignity was afterwards transferred to the church of St. Jago de Compostella: and Oviedo again became a bishopric: the revenue of it is estimated at 125*l*.

Oviedo contains an episcopal palace, a cathedral, a collegiate chapter, three parishes, three convents of monks, three of nuns, three colleges, three hospitals, an university founded in 1580, a drawing school, a royal audience, an alcade mayor, a common administration, &c. Its population is estimated at about 6400 inhabitants. The streets are tolerably straight, regular, and well paved; the principal square is handsome and large, and almost all the streets open into it, and the market is held there. The public edifices are a Gothic cathedral, said to be built by Froila I. in 760, and containing a rich treasury of valuable vases, relics and ornaments, and the bones of 14 kings and queens; the beautiful church of San Salvador, built by a prince named Sito, who flourished in 774, and enriched by a great number of relics; the university, which is considered one of the handsomest ornaments of the town; and the aqueduct of forty arcades. Oviedo has little commerce: it has two tan-yards, a manufactory of hats, one of horn-combs and bone buttons, and a grand magazine of arms for the army; 47 miles N. of Leon. N. lat. 43° 19'. W. long. 5° 57'.

OVILIA, or SEPTA, in *Ancient Rome*, a place in the Campus Martius, at first railed in like a sheep's pen; whence its name.

Afterwards it was mounted with marble, and beautified with walks and galleries; as also with a tribunal, or seat of justice.

Within this precinct, or inclosure, the people were called to give their suffrages for the election of magistrates.

The ascent into the ovilia was not by stairs, but by pontes; a sort of bridges made for the time; every curia, tribe, and century, as the assembly was centuriate or tribute, &c. having its proper bridge.

Whence the proverb, *de ponte deiciendus*, where a person is to be debarred from giving his vote. See COMITIA.

OUINEASKE, or SHELBURNE Bay, in *Geography*, a bay on the E. side of lake Champlain, which sets up southerly, through the town of Burlington, in Vermont, into the northern part of Shelburne.

QUINICHTAGAN, a lake of Lower Canada; 138 miles N. of Quebec. N. lat. 50°. W. long. 70° 56'.

OVIPA.

OVIPAROUS, in *Natural History*, a term applied to such animals as produce their young *ab ovo*, from eggs; as birds, insects, &c.

The oviparous kind stand in opposition to those which bring forth their young alive, called viviparous animals, as man, quadrupeds, &c.

Oviparous animals may be defined to be such as conceive eggs, which they afterwards bring forth, and from which, by the incubation of the parent, or some other principle of warmth and fermentation, at length arise animals; which after they have spent the moisture or humour they were surrounded withal, and are grown to a sufficient bulk, firmness, and strength, break their shell, and come forth.

The oviparous kind, beside birds, include divers species of animals; as serpents, lizards, tortoises, crabs, lobsters, frogs, &c. See **EGG**.

The distinction between oviparous and viviparous creatures, seems, in the insect world, to be much less fixed and determinate than is supposed. It is evident, that some flies, which are naturally oviparous, if they are kept from the finding a proper nidus for their eggs, be it meat, or any thing else, will retain them so long beyond their due time of exclusion, that they will hatch into worms in the body of the parent, and be afterwards deposited alive in flesh, or in the manner of the young of the viviparous insects. Bartholine gives an account, in his *Medical Observations*, of a hen, which, instead of eggs, brought forth no less than five living chickens; but she died of it.

OVIS, the Sheep, in *Zoology*, a genus of the class and order *Mammalia Pecora*. The generic character is; horns hollow, wrinkled, turned backwards and outwards into a circular or spiral form. It has eight lower fore-teeth, and is without tusks. The animals of this genus are gentle, harmless, and useful; they supply food and raiment, and prefer open plains; they are not very active, and fight by butting each other with the head reclined; they threaten by stamping the ground with their feet; they drink little; the females are gravid five months, bring one or two, rarely three, young at a time. According to the Linnæan system there are four species, but Dr. Shaw includes the whole genus in three species, making the *strepsiceros*, or Cretan sheep, a mere variety of *O. aries*. We shall abide by the Linnæan arrangement.

Species.

ARIES; Common sheep. Horns compressed and lunate. Of this species there are 13 varieties.

1. The hornless sheep, of which the tail and scrotum hang as low as the knees; breeds of this kind of sheep are raised in many counties of England, and some other parts of Europe.

2. Black-faced sheep; this is horned; the tail is short; the wool is short and coarse.

3. Spanish sheep that has spiral horns, lengthened outwards; the wool is fine and plentiful. The principal distinction of the Spanish sheep is the fineness of the fleece, and the horizontally extended spire of the horns.

4. Many-horned sheep; this has more than two horns; it occurs in the northern parts of Europe more frequently than in other regions, and is said to be the most common in Iceland. The horns are either three, or four, or five, in number; sometimes placed with the greatest regularity, and sometimes differing in proportion and situation. A four-horned variety, with very long hairs hanging from the breast, is also found in some parts of Europe; the two largest horns are straight, and nearly upright on the top of the

forehead, while the smaller pair are seated on each side the head, and turn downwards.

5. African sheep. Hair instead of wool, short.

6. Guinea sheep. Ears pendulous; dewlaps lax, hairy; hind part of the head prominent. This, which is sometimes termed the Cape sheep, and which is erroneously mentioned in Buffon's *Natural History* as of Indian extraction, is supposed to be most frequent in Guinea, and is distinguished from others by its remarkably meagre appearance, length of neck and limbs, pendant ears, and long arched or curved visage. It is covered with hair rather than wool, and has a pair of pendent hairy wattles beneath the neck, as in goats. The horns are small, and the tail long and lank.

7. Broad-tailed sheep. This is distinguished by a long and very broad tail. It is found in Syria, Barbary, and Ethiopia. Also in Tartary, Tibet, &c. Its general appearance, as to the other parts of the body, scarcely differs from that of European sheep, and in Tibet it is remarkable for the exquisite fineness of its wool. The tails of these sheep are said to grow so large as to weigh from fifteen to fifty pounds, and in order to enable the animal to graze with convenience, the shepherds are often obliged to put a board, furnished with small wheels, under the tail. This part of the sheep, as an article of food, is reckoned a great delicacy.

8. Fat-rumped sheep. Ears large, pendulous; large fatty cushions on the hips, and without a tail; or if there be a tail it is so enveloped with fat as to be scarcely visible, the parts on each side swelling out into a pair of naked hemispheres, of such a size as sometimes to weigh nearly forty pounds. The sheep of this variety are found in many of the Tartarian deserts from the Wolga to the Irtysh and the Altaic chain of mountains.

9. Bucharian sheep. Ears large, pendulous; cushions on the hips less; the tail is long and flat.

10. Long-tailed sheep. The tail is very long and woolly.

11. Cape sheep. Ears large, pendulous; tail large and broad.

12. Bearded sheep. Beard long, divided, hanging from the lower parts of the cheeks and upper jaw.

13. Morvant. Beard long, on the fore-part of the breast; neck with a short mane.

Such are the several varieties as described by Gmelin and others; who observe that this animal, in its state of complete domestication, appears as stupid as it is harmless; it is characterized by Buffon as one of the most timid, imbecile, and contemptible of quadrupeds. When sheep, however, have an extensive range of pasture, and are left, in a considerable degree, to depend on themselves for food and protection, they exhibit a more decided character. A ram has been seen in these circumstances to attack and beat off a large and formidable dog, and even a bull has been felled by a stroke received between his eyes as he was lowering his head to receive his adversary on the horns and toss him in the air. Sheep display considerable sagacity in the selection of their food, and, in the approach of storms, they perceive the indications with accurate precision, and retire for shelter always to the spot which is best able to afford it. The sheep is more subject to disorders than any of the domesticated animals; giddiness, consumption, scab, dropy, and worms frequently seizing upon and destroying it. Of all disorders the most fatal is owing to vast numbers of worms of the genus *fasciola* (which see), which are found in the liver and gall-bladder. They are of a flat form, of an oval shape, with slightly pointed extremities, and bear a general resemblance to the seeds of a gourd. The fly is another formidable enemy, and is often fatal in the course of twenty-four

hours, breeding within the skull of the animal. To extricate the sheep from this danger, the French shepherds apply the *trephine* without the smallest hesitation, and with the greatest dispatch and success.

AMMON; Siberian sheep. Horns arched, semi-circular, above wrinkled, flattish beneath, dewlaps lax, hairy. A variety of this species has its body brown tinged with tawny; a white mark on each side pointing to the belly. It inhabits in flocks the rocky dry deserts of Asia, Barbary, and Corsica; it is the size of a small deer; active, swift, wild; the fat and flesh are delicious. In summer the colour is brownish-ash mixed with grey; beneath whitish-grey; the tail is short, white and brownish at the tip; the hair is long in the winter, and is shed in the spring; the ears are erect, acute; the hind-feet are longer than the fore. The favourite regions of these wild sheep are Siberia, Kamtschatka, and the Kurile islands. They are social animals, and feed together in small flocks. They are the most useful animals that the Kamtschadales possess.

PUDU. Horns round, smooth, divergent. It inhabits the Cordilleras in South America, is gentle, descends in the winter into the vallies; size of a half-grown kid, and resembles a goat, but the horns are turned round outwards; it has no beard, the female is without horns, the colour is dusky. The animals of this species feed together in flocks; in the mildest months they frequent the summits of the mountains, but retire from the severity of winter into the vallies, where they are easily taken, and when taken, of whatever age, it is not difficult to domesticate them.

STREPSICEROS; Cretan sheep. Horns erect, carinate, spirally twisted. It is found principally in the island of Crete, and is kept in several parts of Europe for the singularity of its appearance; the horns being very large, long, and twisted like a screw; those of the male are upright; those of the female at right angles to the head.

OUISCONSING, in *Geography*. See **Ooiscosin**. This river has a communication with Fox river, which passing through Winnebago lake, enters Puan bay in lake Michigan. On this river and its branches reside the Indians of its name, furnishing 300 warriors.

OUSTISI, in *Zoology*. See **Simia Iacchus**.

OUIATANOU, or **OUIATANON**, in *Geography*, a town and fort of North America, in the Indiana territory, on the W. side of the Wabash. N. lat. $40^{\circ} 38'$. W. long. $87^{\circ} 58'$. Thus far the Wabash is navigable, 412 miles from its mouth, for bateaux drawing three feet water. A silver mine has been discovered here. The neighbouring Indians are the Kickapoos, Musquitons, Pyankishaws, and a principal part of the Ouitanons. All these tribes, collectively, could, about 30 years ago, furnish 1000 warriors.

OIJULINGA, a town of Bengal; 25 miles N.E. of Kishenagur.

OIJULINKA, a town of Thibet, near lake Jamdro; 42 miles E.S.E. of Kiang-fee.

OUKAKEE, a lake of Canada; N. lat. $50^{\circ} 20'$. W. long. $86^{\circ} 30'$.

OUKERCK, a town of Holland; 7 miles S. of Naarden.

CUKE-SIMA, an island in the Chinese sea, near the coast of Tonquin; about 30 miles in circumference. N. lat. $18^{\circ} 44'$. E. long. $105^{\circ} 42'$.

OUKE-TANACSA, a town of Thibet; 90 miles E. of Lassa.

OULAIS, a town of Sweden, in the government of Ulea; 25 miles S.S.E. of Brahestadt.

OULAN-HOTUN, a town of Chinese Tartary, in the territory of the Monguls; 120 miles N. of Peking.

OULAN-TABALAN, a town of Thibet; 58 miles S. of Cha-tcheou.

OULART, a small post-town of Ireland, in the county of Wexford; 57 miles S. from Dublin and 10 N. from Wexford.

OULBARAYA, a town of Bengal; 48 miles E.S.E. of Burdwan.

OULCHY le Chateau, a town of France, in the department of the Aisne, and chief place of a canton, in the district of Soissons; 10 miles S. of Soissons. The place contains 307, and the canton 7790 inhabitants, on a territory of 260 kilometres, in 31 communes.

OULLER, or **TAL**, the name of a lake in Hindoostan, which lies near Sirinagur, and receives the river Behut. This lake is said to be of great extent, no less than 53 British miles in circuit, or perhaps 16 or 17 across; according to which statement it may reach to the frontiers of Little Thibet. The course of the Behut is to the N.W. from Sirinagur to the lake; but the length of its course in this direction is not ascertained, any more than the length and direction of its course from the lake to its entry between the mountains at Barchmooleh. It may, however, be inferred, that the course of the Behut, after its efflux from the lake, is short, and towards the S.W. quarter; by which, Barchmooleh will take a W. by N., or W.N.W. position, in respect of Sirinagur.

OULNEY. See **OLNEY**.

OULSTEEN, an island near the coast of Norway, triangular in its form, and 24 miles in circumference; 120 miles N. of Bergen.

OULUA, a town of Hindoostan, in Bahar; 20 miles S.S.E. of Bettiah.

OULUSTON, a lake of Chinese Tartary, in the country of the Monguls. N. lat. $43^{\circ} 25'$. E. long. $114^{\circ} 42'$.

OULX, a town of France, in the department of the Po, late in Piedmont, situated in a valley, which derives from it its name; taken by the French in May 1794; 5 miles N. of Sezanne.

OUMA, a river of Africa, in Congo, which runs into the Bokian; 15 miles S. of Pango.

OUMARY, a town of Hindoostan, in Goondwana; 16 miles S. of Nagpour.

OUMIEN, a name given by the Chinese to a peculiar sort of porcelain, of which they are very fond. It is black, ornamented with gold. They sometimes also call the blue and gold, which is made in the same manner, by the same name. They colour it with three parts of the azure, and seven parts of oil of stone, and lay on the gold afterwards. If they would have it blueish, they add less of the azure, and some cerufs white.

OU-MONG, in *Geography*, a town of the first rank in China, in Se-tchuen. N. lat. $27^{\circ} 20'$. E. long. $103^{\circ} 29'$.

OUNCE, **UNCIA**, a little weight, the sixteenth part of a pound avoirdupois; and the twelfth of a pound troy.

The word is derived from the Latin, *uncia*, the twelfth part of any whole, called *as*; particularly in geometrical measures, an inch, or the twelfth part of a foot.

The ounce *avoirdupois* is divided into sixteen drachms.

The ounce *troy* into twenty penny-weights, and the penny-weight into twenty-four grains. See **WEIGHT**.

The ounce, *once*, makes the eighth part of a French mark, and is divided into three gros or drachms: the drachm into three penny-weights or scruples; and the scruple into twenty-four grains; each grain being computed to weigh a grain of wheat.

All

All precious merchandizes, as gold, silver, silk, &c. are sold by the ounce.

OUNCE *Pearls*, are those too small to be sold by tale; usually called *seeds of pearl*, or *seed-pearls*.

OUNCE *Cottons*, brought from Damascus, are of a kind and quality superior to any other cotton.

OUNCE, in *Zoology*. See FELIS.

OUNCLE, in *Geography*, a market-town and parish, in the hundred of Polebrook, and county of Northampton, England, is situated on the north bank of the river Nen, which, making a horse-shoe bend in its course here, almost environs the town. Camden, and the author of "Magna Britannia," assert that its proper name is Avondale, as standing in the vale of Avon, the original appellation of the Nen. But this opinion seems extremely doubtful, as we find this place mentioned in the Domesday-book, under the designation of Undele. The market-day in Oundle is Saturday, and there are four fairs annually. Here is an excellent free grammar-school, founded by sir William Laxton, a native of the town, and who was lord-mayor of London in 1544. The same beneficent person likewise erected and endowed the alms'-house, and placed both it and the school under the patronage of the Grocers' company of London, of which he was a member. The charity-school, established in 1620, owed its origin to the munificence of Nicholas Latham, who was for more than fifty years rector of Barnwell St. Andrew's. This person also founded a guild, or hospital here for the reception of sixteen aged women, who have a weekly allowance for their support.

The church belonging to this town is a spacious edifice, consisting of a nave, north and south aisles, transept and chancel, with a square tower, surmounted by an hexagonal, crocketed spire. The tower displays a series of five stories, and is terminated at each angle by a small octagonal turret. Over the river here are two large bridges, one on the road towards Thrapston, and the other on that leading to Yaxley, in Huntingdonshire. The former, called North-bridge, is generally much admired, not only on account of the number and forms of its arches, but also for its causeway, which is formed on an arcade, and secures a passage to and from the place during the time of floods. Peter Haught, author of the "Rival Friends," "Senile Odium," &c.; and Dr. John Newton, a celebrated divine and mathematician, were natives of this town.

About three miles to the south-east of Oundle, the Roman road called the Via-Devana crosses the country in an oblique direction from south-east to north-west. Adjoining to this road is the parish and village of Aldwinckle-All-Saints, distinguished as the birth-place of the poet Dryden, one of the most original and energetic writers of his age. Aldwinckle-St. Peter's, to the west of this parish, is likewise noted as the birth-place of Dr. Thomas Fuller, author of a "Church History," "A History of the Worthies of England," and various other works. (See FULLER.) At Barnwell St. Andrew stand the ruins of a castle, erected by Reginald le Moine, and described by Leland under the title of "Berenarius Moynes Castell." It was long the baronial residence of the Montecute and Montague families, but has been for many years uninhabitable. It still forms, however, a very noble and curious specimen of ancient architecture, much of the original structure having survived the attacks of time and of alteration. The present remains consist of four round masonry bastion towers, one standing at each angle of a quadrangular court, which is inclosed by a wall three feet in thickness. Three of these connecting curtains are nearly entire, but that on the western side is considerably dilapidated. The grand gateway, at the south-east front, still remains,

and is flanked by similar circular bastion towers of smaller dimensions.

Cliff-Regis, or King's-Cliff, situated north-west from Oundle, is traditionally said to have derived its name from the circumstance of king John having had a hunting-seat here. It was formerly a market-town, but this privilege has been long discontinued. The Rev. William Law, a celebrated polemical and non-juring divine, was born at this place in 1636. He is chiefly distinguished for his zealous vindication of the doctrine of the eucharist against the sentiments maintained by bishop Hoadly, in the Bangorian controversy.

The village of Fotheringay, which lies to the east of King's-Cliff, and rather nearer to Oundle, is a place conspicuous on the page of English history. Here was anciently a castle, probably first erected by Simon St. Liz, or Senliz, second earl of Northampton, in the time of the Conqueror. It was afterwards entirely rebuilt, however, in the reign of Edward III., by Edmund Langley, duke of York, and passed by marriage from that family into the possession of the Scottish kings, and in the 14th year of the reign of king John, David of Scotland was summoned to surrender it to the crown of England. William de Fortibus, earl of Albemarle and Holderness, took it by surprise when it was held by Ranulph, earl of Chester, and having placed a garrison in it, ravaged the adjacent country. It was soon again, however, yielded to the crown, and constituted for some time the residence of king Edward IV., and here Alexander, king of Scotland, had an audience of that monarch, and promised to do fealty and homage to him for his possessions in England. Henry VIII. settled this honour in dower on queen Catharine of Arragon, whom he so flagitiously divorced. But what renders it more particularly a subject of historical interest, is its connection with the fate of the unfortunate Mary, queen of Scots, who was tried, condemned, and executed here, to the indelible blemish of the otherwise illustrious reign of her rival Elizabeth. Nothing now remains of this once noble pile but the scite, the whole having been razed to the ground by the order of king James, immediately after his accession to the English throne.

Fotheringay village was formerly much more extensive and important than at present. It was indeed a considerable town, and had a weekly market, and three annual fairs. The grammar-school, which is still supported, was erected and endowed by queen Elizabeth. The church anciently belonged to a college for secular canons, founded by Edward, duke of York, in the year 1412, whose revenues at the dissolution amounted to 489*l.* 15*s.* 9*d.* It contains several monuments in honour of the dukes of York. Brydges's History and Antiquities of Northamptonshire, 2 vols. folio. Beauties of England and Wales, vol. xi., by John Britton, F.S.A.

OUNIAH, a town of Asiatic Turkey, in the government of Sivas, on the Black sea; 80 miles N. of Sivas.

OVO, a small island in the Mediterranean. N. lat. 35° 39'. E. long. 25° 27'.

OVOCAL, a river of Ireland, in the county of Wicklow, which runs into St. George's channel, a little below the town of Arklow, which is situated on it. It passes through a very interesting country, both as to natural beauties and mineralogical productions. In one of its tributary streams were found the pieces of gold which have excited so much attention.

OVOLO, OVUM, in *Architecture*, a round moulding, whose profile or sweep in the Ionic and Composite capitals, is usually a quadrant of a circle; whence it is also popularly called the *quarter-round*.

It is usually enriched with sculptures among the ancients,

in form of chefnut shells; whence Vitruvius, and others of the ancients, call it *echinus*, chefnut-shell.

Among us, it is usually cut with the representation of eggs and anchors, or arrows' heads, placed alternately; whence its Italian name *ovolo*; Latin, *ovum*; and French, *auf*; q. d. egg.

OUPLE, in *Geography*, a town of Hindoostan, in Dowlatabad; 10 miles E. of Perinda.

OUR, in *Ichthyology*, a variety of the *MUGIL ebuli*.

OUR Lady. See NOTRE DAME.

OUR Lady of the Thistle. See THISTLE.

OURA, in *Geography*, a town of Portugal, in the province of Tras los Montes; 9 miles S. of Chaves.

OURAN, or URAN SOANGUS, the name of an imaginary sect of magicians in the island Grombocanore, in the East Indies.

The word implies *men-devils*: these people were ridiculously supposed to have had the art of rendering themselves invisible, and passing where they pleased, and, by these means, doing infinite mischief; for which reason the people hate and fear them exceedingly, and always kill them on the spot, when they can take them.

OURDA, in *Geography*, a town of Bengal; 72 miles N. of Dacca.

OUREM, a town of Portugal, in Estramadura, seated on a mountain, containing 1800 inhabitants; 12 miles W. of Thomar.

OUREOS, a small island in the gulf of Engia; 14 miles N.W. of Engia.

OURFA, ROHHA, or *Rouah*, a town of Asiatic Turkey, in the province of Diarbekir, anciently called "Edeffa," which see; watered by a canal from the Euphrates. Many persons, particularly among the learned Jews, have supposed it to have been the Ur of the Chaldees. The Greeks gave it the name of Edeffa; and in honour of Antiochus, it was called Antiochia, which was distinguished from others of the same name by the famous fountain Callirrhoe, and denominated Antiochia ad Callirrhoem.

Ourfa is built upon two hills, and in the valley between them, at the S.W. corner of a fine plain, rendered more beautiful by the rocky, mountainous parts that surround it: it is about three miles in circuit, encompassed by ancient walls, and defended by square towers. On the north side is a deep fosse, and the castle stands on a hill to the south. Although the town is not well laid out, parts of it are well built. Its chief beauty consists in some fine springs, that rise between the two hills, and even in the walls of the city. The ascent to the castle is very steep, and on three sides of it is a deep fosse: it is about half a mile in circumference, and has two Corinthian pillars, the capitals of which are admired; the columns consist of 26 stones, each about one foot six inches thick. They are probably the remains of a portico belonging to some large temple. According to tradition, the throne of Nimrod stood on these pillars; but it is certain that Timur Bec erected some trophies on them. Ourfa is the residence of a pacha, who commands not only the greatest part, if not the whole, of Macedonia, but a considerable tract of country to the west of it as far as Antab. This place carries on a great trade, as it is the great thoroughfare into Persia. They prepare Turkey leather here, especially that of the yellow kind, for which they were formerly famous. The Armenian Christians, of whom there is a considerable number, have two churches, one in the city and another near it, in the latter of which they shew the tomb of a great saint, whom they call Ibrahim, and who was probably Ephraim Syrus, formerly deacon of Edeffa. The surrounding country is fertile in corn and fruit. This

town was first taken by the Saracens in 1087, retaken by the Christians in 1097, and seized in 1142 by the Turks, who have ever since retained possession of it; 80 miles S.W. of Diarbekir. N. lat. $36^{\circ} 50'$. E. long. $38^{\circ} 25'$.

OURGOOR, a town of Hindoostan, in Golconda; 30 miles N.N.W. of Rachore.

OURICO, in *Zoology*. See *HYSTRIX Prebensilis*.

OURIGUI, in *Geography*, a town of Hindoostan, in Dowlatabad; 15 miles S.S.E. of Kondur.

OURIQUE, a town of Portugal, in Alentejo, containing about 2000 inhabitants; 24 miles S.W. of Beja. N. lat. $37^{\circ} 39'$. W. long. $8^{\circ} 9'$.

OURISIA, in *Botany*, a name of which we find no explanation. It was contrived by Commerfon; possibly from *ὄρος, ὄρεος*, a mountain, in allusion to the natural station of the plant. Juss. 100. Brown. Prodr. Nov. Holl. v. 1. 438. Class and order, *Didymia Angiospermia*. Nat. Ord. *Personata*, Linn. *Pedicularis*, Juss. *Scrophularina*, Brown.

Gen. Ch. *Cal.* Perianth inferior, in five deep, somewhat unequal segments, permanent. *Cor.* of one petal; tube funnel-shaped, ascending, longer than the calyx; limb in five, obtuse, nearly equal lobes. *Stam.* Filaments four, inserted into the bottom of the tube, curved closely along its upper side, two of them rather the longest; anthers incumbent, within the tube; some describe the rudiment of a fifth stamen. *Pist.* Germen superior, two lobed; style the length and position of the stamens; stigma of two obtuse lobes. *Peric.* Capsule two-lobed, of two cells, and two valves, the partitions from the centre of the valves. *Seeds* numerous, with a lax tunic-like skin.

Ess. Ch. Calyx deeply five-cleft, rather unequal. Corolla funnel-shaped; limb five-cleft, nearly equal, obtuse. Stigma two-lobed. Capsule of two cells, and two valves; the partitions from the centre of each valve. Seeds with a lax tunic-like skin.

1. *O. ruelloides*. (*Chelone ruelloides*; Linn. Suppl. 279. Willd. Sp. Pl. v. 3. 226.)—Leaves roundish-ovate, unequally crenate. Flower-stalks axillary, opposite.—Native of Terra del Fuego, in the clefts of rocks. *Root* perennial, creeping, with woolly fibres. *Stems* procumbent, short, smooth. *Leaves* on long erect stalks, roundish-ovate, about two inches long, nearly smooth, with one central rib, and two pair of lateral ones, their margin unequally and rather bluntly crenate; the under side palest. Flowering branches decumbent, hardly a span long, smooth, bearing two or three pair of rounded notched leafy bracteas. *Flowers* purple, on long, smooth, axillary, solitary, opposite, naked, simple stalks, from the two uppermost pair of bracteas. *Calyx* fringed. See CHELONE, sp. 3. erroneously printed *melloides*.

2. *O. integrifolia*. Brown. n. 1.—Leaves nearly ovate, entire. Flower-stalk terminal, mostly solitary. Gathered by Mr. Brown in Van Diemen's land. A smooth creeping plant, with a calyx more equally and deeply divided than the first species, as well as a shorter corolla, and a different aspect, so that its discoverer was partly inclined to think it generically distinct. We have seen no specimen of this last.

OURISSIA, in *Ornithology*, a species of the *Trochilus*; which see.

OURO, in *Geography*, a river of Africa, which runs into the Atlantic, N. lat. $23^{\circ} 30'$.—Also, a river of Africa, which runs into the Indian sea, S. lat. $24^{\circ} 25'$.

OUROE, a small island of Denmark, near the coast of Zealand, in the Isefiord gulf; 4 miles N.E. of Holbeck. N. lat. $55^{\circ} 46'$. E. long. $11^{\circ} 50'$.

OUROLOGY, in *Medicine*, is the doctrine of diseases, as judged of by the appearances of the urine.

The changes in the sensible qualities of the urine, under different

different circumstances of disease, are considerable, and the ancients deduced many pathological inferences from these changes, and wrote ample treatises in explanation of their doctrines. Much of their supposed knowledge on the subject was, however, purely hypothetical, and altogether unworthy of serious attention. Although, doubtless, some indications are to be obtained from the appearances of the urine, both in acute and chronic complaints, yet these are much more limited than was formerly believed; and those who pretend to ascertain the nature of diseases, by inspecting the urine of the patient alone, are, therefore, impostors of the lowest class; and it is truly discreditable to the general information of the age, that the Meyersbachs and Van Butchels still live upon the credulity of a British people.

The medical indications, as well as the chemical properties, of this excretion, will be treated of under the proper head. In the mean time, we may observe, that Dr. Blackall, a physician of Exeter, has recently given an importance to *uroscopy*, which it never before possessed, by shewing that, in many cases of dropsy, and other chronic diseases, the urine contains much of the coagulable part of the blood, and thence deducing some important practical indications. See URINE.

OUROVANG, in *Ornithology*. See TURDUS *Urovang*.

OURRED, in *Geography*, a high hill of the county of Galway, Ireland, in the western district, at the bottom of which is a lake of the same name.

OURRY'S ISLAND, or *New Alderney*, an island in the South Pacific ocean, discovered by Capt. Carteret, in August 1767, being one of the cluster called Queen Charlotte's islands, about ten miles long and three broad. S. lat. $11^{\circ} 10'$. E. long. $165^{\circ} 19'$.

OURS, in *Zoology*. See URSUS.

OURSE, in *Geography*, a river of France, which runs into the Seine, at Bar sur Seine.

OURTE, or OURTHE, one of the 13 departments of the region of France, called the Reunited country, formed of part of Liege and of Limbourg, and deriving its name from the river Ourte, or Ourthe, which rises from two springs, one near St. Hubert, the other near the town of Ourte, both which unite near La Roche, and run into the Meuse at Liege. This department is 42 French leagues long, and 12 broad, contains $4002\frac{1}{2}$ kilometres, or 213 square leagues, and 313,876 inhabitants, and is situated N.E. of Sambre and Meuse, in N. lat. $50^{\circ} 35'$. It is divided into three circles or districts, 30 cantons, and 383 communes. The circles are Liege, including 151,975, Malmedy, 100,565, and Huy, 61,336 inhabitants. According to Haslenfratz, it comprehends 5 circles, 36 cantons, and 310,444 inhabitants. Its contributions amounted, in the 11th year of the French era, to 2,424,974 francs, and its expences to 295,573 fr. 39 cents. Its capital is Liege. The first of the circles abounds in mines of iron, coal, and alum; in the second are Spa waters; and in the third are mines of iron, alum, sulphur, coal, &c.

OURTHE, or OURT, a town of France, in the department of the Forests; 4 miles N. of Luxemburg.

OURTON-POULAC, a town of Thibet; 15 miles S.W. of Yolotou-Hotun.

OURTS, in *Agriculture*, a provincial term applied to the leavings of fodder made by cattle. Sometimes written *orts*.

OURUCZE, in *Geography*, a town of Poland, in Volhynia; 68 miles N.N.E. of Zytomiers.

OURVILLE, a town of France, in the department of the Lower Seine, and chief place of a canton, in the district of Yvetot; 9 miles W. of Fécamp. The place contains

1257, and the canton 9553 inhabitants, on a territory of $117\frac{1}{2}$ kilometres, in 19 communes.

OUSBY, a town of Sweden, in the province of Schonen; 23 miles N. of Christianstad.

OUSCOTTA, a town and fortrefs of Hindoostan, in Mysore, taken by earl Cornwallis in April 1791; 15 miles N.E. of Bangalore.—Also, a town of Hindoostan, in the circuit of Sanore; 25 miles N. of Sanore.

OUSE, or *Grand River*, a river of Canada, which rises in the country belonging to the Chippewa and Mississauga Indians, and running southerly through the west riding of the county of York, crosses Dundas street, and passing between the counties of Lincoln and Norfolk, discharges itself into lake Erie, about half-way between the Foreland and fort Erie. N. lat. $42^{\circ} 50'$. W. long. $79^{\circ} 30'$. About 40 miles up this river is the Mohawk village. The Senecas, Onondagoes, Cayugas, Augagas, Delawares, and Mississagas, have also villages on different parts of this river.

OUSE, a large river of England, which rises in two branches not far from Brackley and Towcester, on the borders of Northamptonshire and Oxfordshire, whence it flows eastward, through Buckinghamshire, by Newport-Pagnell and Olney, into Bedfordshire. After flowing several miles in the same direction, it makes a rapid sweep to the south, descending as far as Bedford, at which place it again bends to the north-east, passing through the centre of the fens of Cambridgehire, where it is joined by the Cam, the Lesser Oule, and the Larke, all of which are considerable streams. It afterwards enters Norfolk, and traverses the western division of that county, till it falls into The Wash, a gulf of the sea formed by the projecting coasts of Norfolk and Lincolnshire. A general Account of all the Rivers of Note in Great Britain, &c.; by Henry Skrine, esq. L.L.B. 8vo. Lond. 1801. Beauties of England and Wales, vol. xi. Northamptonshire.

OUSE, a large river in Yorkshire, England, is formed by the junction of the Ure and the Swale, two very considerable streams, which take their rise in the northern moors of the county. The course of this river is nearly south-east, by Nun-Monkton, where its waters are increased by those of the Nid, to the city of York; after passing which, it flows almost directly south to Cawood. Near this place it is joined by the Wharfe, which has its source at the foot of the Craven-Hills, and changing its direction again to the south-east, runs past the town of Selby. About five miles below that town it receives the Derwent, and two miles still lower down, the Aire, the second most considerable river of Yorkshire. Thus augmented, the Ouse becomes as wide as the Thames at London, and after making a circuit to the south near Swinesfleet, takes a north-easterly direction to its confluence with the Trent from Lincolnshire. These rivers united constitute the Humber, which is the most important estuary in the north of England. See HUMBER. A general Account of all the Rivers of Note in Great Britain, &c. by Henry Skrine, esq. L.L.B. 8vo. 1801.

OUSEEL, PHILIP, in *Biography*, a learned German, who flourished in the eighteenth century, was born at Dantzic in the year 1671. He became minister of the German church at Leyden, and was afterwards professor of divinity at Frankfort on the Oder. He died in 1724, at the age of fifty-three. His most important works are, "Introductio in accentuationem Hebræorum Metricam;" "Introductio in accentuationem Hebræorum Prosaicam;" "De Lepa;" and some treatises on the ten commandments.

OUSERAU, in *Geography*, a town of Hindoostan, in Bahar; 25 miles W.N.W. of Rotasfur.

OUSOURI,

OUSOURI, a town of Chinese Tartary; 67 miles S.S.W. of London.

OUSSOOR, a town of Hindoostan, in Myfore; 69 miles E.N.E. of Seringapatam. N. lat. 12° 41'. E. long. 77° 52'.

OUST, a town of France, in the department of the Ariège, and chief place of a canton, in the district of St. Girons; 7½ miles S. of St. Girons. The place contains 1199, and the canton 12,407 inhabitants, on a territory of 525 kilometres, in 10 communes.

OUSTAD, a town of Norway, in the province of Christianland.

OUSTED, formed from the French *oster*, to remove, or take away, in our *Ancient Law Books*, a being removed, or put out of possession.

OUSTER, or **DISPOSSESSION**, in *Law*, is an injury that carries with it the amotion of possession; for thereby the wrong-doer gets into the actual occupation of the land or hereditament, and obliges him that hath a right to seek his legal remedy, in order to gain possession, and damages for the injury sustained. This ouster may either be of the freehold by *abatement*, *intrusion*, *disseisin*, *discontinuance*, and *de-forcement*; or of chattels real, as an estate by statute-merchant, statute-staple, or elegit, or an estate for years.

An abatement is where a person dies seized of an inheritance, and before the heir or devisee enters, a stranger who has no right makes entry, and gets possession of the freehold: this entry of him is called an abatement, and he himself is denominated an abator. For the other species of ouster, see the several terms that express them.

Ouster, or amotion of possession from estates held by statute, recognizance, or elegit, is only liable to happen by a species of disseisin, or turning out of the legal proprietor, before his estate is determined, by raising the sum for which it is given him in pledge. And for such ouster, though the estate be merely a chattel interest, the owner shall have the same remedy as for an injury to a freehold, *viz.* by assise of novel disseisin. But this depends upon the several statutes, which recite these respective interests, and which expressly provide and allow this remedy, in case of dispossession. (The statutes are stat. Westm. 2. 13 Edw. I. c. 18. Stat. *de mercatoribus*, 27 Edw. III. c. 9. Stat. 23 Hen. VIII. c. 6. § 9.) Upon which account it is that Sir Edward Coke observes (1 Inst. 43.), that these tenants are said to hold their estates *ad liberum tenementum*, until their debts be paid; because by the statutes they shall have an assise, as tenants of the freehold shall have; and in that respect they have the similitude of a freehold.

As for ouster, or amotion of possession, for an estate for years; this happens only by a like kind of disseisin, ejection, or turning out, of the tenant from the occupation of the land during the continuance of his term. For this injury the law has provided him with two remedies, according to the circumstances and situation of the wrong-doer; the writ of *ejectione firme*, which lies against any one, the lessor, reversioner, remainder-man, or any stranger, who is himself the wrong-doer, and has committed the injury complained of; and the writ of *quare ejecit infra terminum*, which lies not against the wrong-doer or ejector himself, but his lessee, or other person claiming under him. These are mixed actions, somewhat between real and personal; for therein are two things recovered, as well restitution of the term of years, as damages for the ouster or wrong. See *EJECTIONE FIRME*, and *QUARE EJECIT*, &c.

OUSTER le Main, *amovere manum*, denotes a livery of lands out of the king's hands; or a judgment given for him that traversed, or sued, a *monstrans le droit*.

When it appeared upon the matter discussed, that the king had no right or title to the land he had seized, judgment was given in chancery, that the king's hand be removed. Hereupon, *ouster le main*, or *amoveas manum*, was awarded to the escheator, to restore the land, &c.

But now all wardships, liveries, *ouster le mains*, &c. are taken away and discharged, by stat. 12 Car. II. c. 24.

OUSTER le Mer, a cause of excuse or effoin; where a man not appearing in court upon summons, it is alleged, that he is beyond the seas.

OUT, in *Sea Language*, a term implying the situation of the sails, when they are let or extended to assist the ship's course, as opposed to *in*; which is also applied, in the contrary sense, to signify when such sails are furled. See **IN**.

OUT of Trim, the state of a ship, when her best sailing qualities are retarded by the injudicious arrangement of the masts and sails, or stowage of her cargo, which will considerably affect the ship's motion and stability.

OUT of Winding, in *Ship-Building*, not twisting, but that the surface, whether of timber or plank, be a direct plane.

OUT, *Outside*, or *Without*, in the *Manege*, is the contrary of *in*, *inside*, *inner*, &c. See **IN**, **INN**, &c.

OUT Field Land, in *Agriculture*, a term applied to a sort of land in Scotland, which is similar to the unclosed common field-lands in this country. Lord Dundonald remarks, that that part of the farm, called the out field-land, never receives any manure. After taking from it two or three crops of grain, it is left in the state it was in at reaping the last crop, without sowing thereon grass-seeds for the production of any sort of herbage. During the first two or three years, a sufficiency of grass to maintain a couple of rabbits *per acre* is scarcely produced. In the course of some years, it acquires a sward; and after having been depastured for some years more, it is again submitted to the same barbarous system of husbandry.

It was a sort of distinction that existed prior to the date of inclosures, and was likewise general throughout England. It is wearing out fast in Scotland, from the same causes which have operated in England.

OUTAITANI, in *Geography*, a town of Upper Siam; 80 miles N.W. of Louvo.

OUTANULLA, a town of Bengal, on the Ganges; 5 miles S. of Rajemal.

OUTAPALLAM, a town of Hindoostan; 10 miles E.N.E. of Coimbatore.

OUTARD BAY, a bay of Canada, on the north side of the river St. Lawrence. N. lat. 42° 2'. W. long. 68° 15'.

OUT-BOARD, in *Sea Language*, on the outside of the ship, as "the out-board works," &c.

OUTCH, in *Geography*, a province of Hindoostan, between the rivers Chunaub and Indus, near the ocean.

OUTCHACTAL, a town of Thibet; 67 miles E. of Haracher-Ho'un.

OUTCHANG, a town of China, of the first rank, in Hou-quang, on the river Yang-tse; 582 miles S. of Peking. N. lat. 30° 36'. E. long. 113° 50'.

OU-TCHEOU, a city of China, of the first rank, in Quangsi. All the rivers of the province unite near this city, which joins to the province of Quang-tong, and is the key of the whole province, and the most considerable city for commerce in it. Within its jurisdiction are one city of the second order, and nine of the third. The territory is partly mountainous, and partly flat. The mountains furnish cinnabar, and an uncommon tree, called Quang-lang, which, instead

instead of pith, has a soft pulp, of which they make flour. N. lat. 23° 28'. E. long. 110° 32'. Grosier.

OUTCHOU, a river of Thibet, which runs into the Sampoo.

OU-TCHUEN, a town of the kingdom of Corea, in King-ki; 59 miles S.S.E. of King-ki.—Also, a sea-port town of China, of the third rank, in Quang-tong; 20 miles S.S.E. of Hoa.

OUTEA, in *Botany*, Aubl. Guian. 28. t. 9. Juss. 347, a barbarous name, contrived by Aublet out of the Caribean appellation of the tree, *Joutay*. Vahl retains this genus, as distinct from the *Vouapa* of the above writer, by the following character.

Calyx turbinate, five-toothed. Petals five; the uppermost very large. Stamens four; one of them abortive. Germen stalked. *Vahl. Enum. v. 2. 38.*

We are much inclined to the opinion of those who judge this plant to be a *Tamarindus*. See MACROLOBIUM.

OUTEIRO, in *Geography*, a town and fortrefs of Portugal, in the province of Tras los Montes, seated on a mountain; 9 miles E.S.E. of Bragança.

OUTER ISLAND, an island on the coast of Labrador, in the cluster called St. Augustine's Square; S.W. of Sandy island.

OUTFANGTHEFE, a privilege whereby a lord was enabled to call any man dwelling in his fee, but taken for felony in another place, to judgment in his own court.

The word is formed from the Saxon *ut, extra, without; fang, capio, vel captus*; and *thief, thief*, q. d. *fur extra-captus*. Spelm.

OUT-FIT, signifies the expences of equipping or *sitting-out* a ship for sea, which includes every thing but the hull, such as masts, yards, sails, cordage, anchors, artillery, ammunition, and all other naval furniture; with a sufficient number of men and provisions.

OUT-HAULER, in *Sea Language*, the rope or tackle made fast to the tack of the jib, to haul it out by.

OUT-HOLLING, in *Agriculture*, a term provincially applied to the shovelling out a ditch, for the use of the manure it contains.

OUT-HOUSE, such a building as belongs to, and is placed adjoining to, the dwelling-house.

OUTIMACS, in *Geography*, a tribe of American Indians, in the territory of Wayne, between lakes Michigan and St. Clair. The number of warriors is 200.

OUTIN, in *Ichthyology*, a name by which some call the fish known among authors by the name of *oxyrinchus*.

OU-TING, in *Geography*, a city of China, of the first rank, in Yun-nan. N. lat. 25° 53'. E. long. 102° 6'.

OUTLAW, UTLAGATUS, one deprived of the benefit of the law, or put out of the king's protection.

Bracton says, an outlaw forfeits every thing he has; and that, from the time of his outlawry, he wears a wolf's head, and any body may kill him *impuné*; especially if he defend himself, or fly. But, in the beginning of king Edward III.'s reign, it was resolved by the judges, that it should not be lawful for any man, but the sheriff alone, (having lawful warrant for it,) to put to death a man outlawed.

OUTLAWRY, or UTLAWRY, *Utlagaria*, the punishment of him who, being called into law, and lawfully fought, does (after an original writ, and the writs of *capias*, alias & pluries, returned by a sheriff with a non est inventus, and an exigent, with a proclamation awarded thereupon) contemptuously refuse to appear.

He must also be called at five county court-days a month between each other; and, if he appear not in that time,

pro exlege tenebitur, cum principi non obediat, nec legi; & extunc exlegabitur; i. e. he shall be pronounced to be out of the king's protection, and deprived of the benefit of the law.

The effect of which is, if he be outlawed at the suit of another, in a civil cause, he shall forfeit all his goods and charters to the king, and the profits of his land, while the outlawry remains in force; and if in treason or felony, all his lands and tenements which he has in fee, or for life and all his goods and chattels: and in this latter case, the law interprets his absence a sufficient evidence of his guilt, and without requiring farther proof, accounts him guilty of the fact, on which ensues corruption of blood. &c. And then, according to Bracton, he may perish without law, &c.

But now, to avoid such inhumanity, it is holden that no man is entitled to kill him wantonly or wilfully; but in so doing, he is guilty of murder, unless it happens in the endeavour to apprehend him: for any person may arrest an outlaw, either of his own head, or by writ or warrant of *capias utlagatum*, in order to bring him to execution. But such outlawry may be frequently reversed by writ of error; the proceeding therein being very nice and circumstantial; and if any single minute point be omitted or misconducted, the whole outlawry is illegal, and may be reversed: upon which reversal, the party accused is admitted to plead to, and defend himself against the indictment.

If after outlawry, in civil cases, the defendant appears publicly, he may be arrested by a writ of *capias utlagatum*, and committed till the outlawry be reversed: which reversal may be had by the defendant's appearing personally in court, (and in the king's bench without any personal appearance, so that he appears by attorney, according to statute 4 and 5 W. & M. cap. 18.) and any plausible cause, however slight, will in general be sufficient to reverse it; it being considered only as a process to compel appearance. But then the defendant must pay full costs, and put the plaintiff in the same condition, as if he had appeared before the writ of *exigi facias* was awarded. It is ordained by Magna Charta, that no freeman shall be outlawed, but according to the law of the land.

A minor, or a woman, cannot be outlawed. A woman is said to be *waived*, when a man is outlawed. See WAIVE.

OUTLAWRIES, *Clerk of the*. See CLERK.

OUTLICKER, or OUTLIGGER, in a *Ship*, a small piece of timber, three or four yards long, as occasion serves, made fast to the top of the poop, and standing right out a-stern: at the uppermost end of it is a hole, into which the standing part of the sheet is received, and made fast through the block of the sheet; and then again received through another block, which is seized to this outlicker, hard by the end of it. This is seldom used in men of war, or in great ships; and whenever it is made use of, it is because the mizen-mast is placed so far aft, that there is not room enough within board to hale the sheet flat.

Outligger seems the true orthography of the word, which appears to be derived from the Dutch *uitlegger*, q. d. *outlier*.

OUTLINE, in *Painting and Drawing*, is the representation of an imaginary line circumscribing the boundary of the visible superficies of objects. It is an arbitrary mode of conveying ideas of form, which has its foundation altogether in art, and was its first essay towards perfection; and although the progress of painting has been so great, and it has so nearly approached to complete imitation by the help of chiaro-scuro and colour, yet outline, simple and unaided, still remains duly appreciated, as efficient to produce the greatest

OUTLINE.

greatest and most essential purposes of art, *viz.* the ideas of action and expression in the figures it represents.

There is not in fact any such thing as an outline in nature. The effect which natural objects produce upon our vision, is only that of a number of parts, or of distinct masses of form and colour, but no lines. We are obliged to aid invention in design by resorting to a fiction; and the first and simplest means which presents itself to the mind is, to separate the objects we desire to represent upon a plane surface, by marking the boundary of each, the extreme extent of its dimensions in every direction; and this we call drawing its outline. We recollect more of a form by its boundary, or its separation from other objects, than by its projecting parts; hence arises the satisfaction we receive from a line which marks that boundary, though no such line in reality exists: our imagination immediately loses sight of the fallacy, and dwells upon the form within it. It is sufficient for this purpose, that the exterior of the form be exhibited correct enough to excite an image of the whole; and perhaps the impression a well-drawn outline makes upon the mind, is seldom much increased, if at all, by the more complete imitation of form which light and shade can give it.

Such an outline is in itself a perfect thing. It has no exemplar in nature, but is received as an arbitrary token of a substance. The image it excites, is, indeed, more or less perfect, according to the information or force of imagination of the beholder; but as there is no other means of comparison than with the reasoning powers of his own mind, its impression must be considered as complete. Fill it with colour, give the form within it light and shade, in short, attempt to make it an imitation of the real object, and it becomes subject to comparisons, which in well-informed minds must necessarily diminish its force. Its simplicity is the basis of its power. The impression, as far as it goes, being complete, if the other requisites of art were not, when added to it, as perfect in their kind as the simple outline, it would certainly be weakened in its main points; a more full image might indeed be presented to the eye, but that fullness of effect which arises when the mind is simply excited to act for itself, would be disturbed, and withdrawn from the pathos of the design.

The value of outline will be most fully appreciated by those who, with Lavater, have observed the fullness of character displayed in *sithouettes*, or profile outlines filled up with only one colour; and still more by those who have examined the beautiful works in outline from Homer, *Æschylus*, and Dante, by Mr. Flaxman. In regarding many of those excellent designs, the mind is so entirely filled with figure, action, and expression, that it almost shrinks with fear at the idea of an attempt at further completion.

Though outline is technically employed, or rather considered in the arts of design, generally, yet it properly belongs only to painting or drawing. *Monf. Wattelet*, in the *Encyclopédie des Beaux Arts*, has given it as his opinion, that the sculptor has more to do with it than the painter, because, as he has observed, every figure wrought in the round has an outline in every view that can possibly be taken of it. But, surely, this is to confound the offices of the two arts completely. If, as we have defined it, outline is an *ideal line* raised by the artist to assist in separating forms, or even to mark the extent of a form, what has the sculptor to do with it, whose occupation consists in producing the forms themselves, of which in painting it is the arbitrary representative? Lines are the foundation of the painter's art; form, that of the sculptor. The latter, with the greatest propriety, takes into his consideration the full form of his subject in every point of view, and to him the outline or

boundary is as much an object in the projecting, as in the receding parts; but this varying use of the term completely confounds the meaning of it: it is no longer the line which separates objects, but the line also which marks forms projecting forwards; a thing absolutely impossible to produce by a line, upon a flat surface, in many cases at least, and to be effected only by light and shade. Nevertheless, the sculptor may usefully convert this emblem of form to his own service, by considering its effects in all views and combinations of his figures; or what kind of outlines his figures would produce, if taken as a model by a painter; and thus it is technically, though not correctly, employed by him; and so far we consider the French editor as right, when he says the sculptor must consider the contour or outline of his works in every direction, and therefore has a difficult task to perform in producing a figure sufficiently beautiful to bear such a test; but when he asserts the opinion which gave rise to these observations, *viz.* that the sculptor has more to do with outline than the painter, he surely forgets, that the latter has to produce the imitation of contour or fullness of form over every part of his figures, although he has properly only one outline; and as form only requires attention, at least in this respect, in one art, and there is a difficult combination of means requisite to produce effect in the other, we cannot but think that the painter who aims to be correct has the severer task of the two, when the composition is once decided upon.

If the art of painting were considered merely as an instrument of moral instruction, or even as a means of relating a fact, outline would be fully adequate to fulfil its purposes. But, although we are not inclined to depreciate the value of this noble art, we agree with those who regard its practice more in the light of ornament than of utility, generally speaking; and in that view of it, outline becomes merely a passive agent to prepare the way for the more splendid effects which *chiaro-scuro* and colour alone can produce.

It is outline which decides the character of a painting; for according to the style in which this is drawn, must be the one adopted in filling up the void; in other words, a figure must have complete union in its character; both in parts which appear to come forwards, and are produced within the outline, as well as in those which recede and form it.

As outline is thus essentially important in the art, it becomes necessarily an object worthy the most serious attention of the professor, and we cannot recommend to a young practitioner a more useful lesson than that he endeavour to attain, as early as possible, the power of drawing an outline free and characteristic; as that power can never be unaccompanied with a certain degree of freedom in the execution of a finished picture: but if not attained while the hand is free, and the mind most alive to impression, the task is rendered proportionably difficult.

What is called acquiring a knowledge of chaste and true or characteristic outline, can be derived from no other source than a pure knowledge of beautiful form. The line which designates it is of less consequence than the form it circumscribes, yet it is an agreeable quality in an artist to be able to plant a pleasing image on the mind, by a light, skilful, and steady hand. There is danger, if the line he draws be too hard, thick, or black, that the figure he intends to convey be forgot in the line: and if too weak, its force may not be adequate to produce the desired effect.

In the works of artists, outline is considered in two distinct points of view. One is the simple and obvious sense of the word, a line marking the form of any given object, such as we have hitherto considered it: and various denominations are given to such a line. It is said to be *correct*, *free*, *firm*, *flowing*,

flowing, &c. or the reverse of either of such qualities. The other is a more arbitrary use of it, which is applied to finished pictures; wherein the figures have lost the marking properly denominated outline, and that name is then applied idly as it is to objects in nature. Thus, figures in a picture are said to have a hard outline, when the extreme parts are not blended in the ground from which they are relieved, or the surrounding parts; or to have a confused one, when they are too much softened and lost in them. The characteristic names given to the line itself are also applied in this case, and designate the style of design employed in the work; such as graceful, grand, severe, decided, &c.; or mean, weak, mannered, incorrect, &c. &c.; for an explanation of which terms we refer to *STYLE*, in *Design*.

In the production of a picture, management of outline constitutes a very essential part of the difficulties to be contended with, both in the arrangement of the composition, and in the completion, for the apparent relief of the objects introduced. In the first place, the arrangement of forms or outlines is the main point wherein reside the expression and character of the subject. If it be of the terrific kind, with figures in violent agitation of mind or body, then strong contrasts in the outlines, and involved forms, will enforce its influence. If it be simple, grand, or severe, the due effect will be most readily attained by parallel forms, or nearly such, assisted and united with slight contrasts; but if the character be merely agreeable, then lines playfully and gracefully combined, are required to produce an appropriate influence on the observer. In the conclusion of the work, the utmost attention must be paid to the perfection of the outlines, that they be not marked too hard, which would make the effect cutting and disagreeable to the eye; or too much blended and weakened: in either case the great object of relief is counteracted. It must be the artist's steady endeavour to steer between these two difficulties, but how to effect that desideratum, to acquire the wished-for medium, depends so entirely on a nice observance of nature, and on inherent taste, that it is quite impossible to give any positive rule: concerning it; the painters of the Dutch and Flemish schools have best exemplified it in their works, to the study of which we recommend our readers.

OUTNESS, is used by some for that relation of things by which one appears out of, or at a distance from, another. Dr. Berkeley, in his "Essay on Vision," makes use of the outness; and observes, that we form no notion of outness from the sense of seeing merely, but only from motion.

OUT-PARTERS, in our *Ancient Writers*, were a sort of thieves or highwaymen, on the frontiers of Scotland, who rode about to fetch in such things as they could lay hold on.

OUT-POSTS, in a military sense, a body of men posted beyond the grand guard, and so called, as being without the rounds or limits of the camp.

OUTRAM, WILLIAM, in *Biography*, a learned English divine, was a native of Derbyshire, and born in the year 1625. He was entered of Trinity college, Cambridge, where he took his degree of B. A., and of which he obtained a fellowship: he afterwards removed to Christ's college, where he likewise obtained a fellowship. In 1649 he took his degree of M. A., and in 1660 that of D. D. He was presented to the rectory of St. Mary Woolnoth in London; afterwards, in 1669, he was collated to the archdeaconry of Leicester, and during the following year he was installed prebendary of St. Peter's church in Westminster. He died in 1679. He acquired celebrity by his skill in rabbinical learning, as well as by his acquaintance with the fathers and the sacred scriptures. He was a constant and

much admired preacher. As a writer, he is entitled to the praise of nervousness, precision, and accuracy. He was author of a learned work on sacrifices, entitled "*De Sacrificiis Libri duo; quorum altero explicantur omnia Judæorum, nonnulla Gentium profanarum Sacrificia; altero Sacrificium Christi. Utrouque Ecclesiæ Catholicæ his de rebus Sententia contra Faustum Socinum, et ejus Sectatores defenditur*," 1677. After his death, a volume of his sermons was published, which are good specimens of pulpit compositions. Biog. Brit.

OUT-RIDERS, are bailiffs errant, employed by sheriffs, or their deputies, to summon people in the remotest parts of their hundreds, to the county or hundred courts.

OUT-RIGGER, in *Ship Building*, a large spar, or strong beam of timber, of which there are several projecting from the side of a ship, to which the masts are secured in the act of *careening*.

OUT-RIGGER is also a small boom, occasionally used in the tops to thrust out the breast-back-flays to windward, in order to increase their tension, and thereby give additional security to the topmast.

OUTSHI-FERMEN, in *Geography*, a town of Little Bucharía; 130 miles E. of Cashgar.

OUTSHOU, a town of Little Bucharía; 30 miles S. of Cashgar.

OUTWARD *Flanking Angles*. See *ANGLE*.

OUT-WORKS, in *Fortification*, all those works made without the ditch of a fortified place, to cover and defend it. See *Fortification according to M. Vauban's method*; under the article *Military CONSTRUCTION*.

Out-works, called also *advanced* and *detached works*, are those which not only serve to cover the body of the place, but also to keep the enemy at a distance, and prevent their taking advantage of the cavities and elevations usually found in the places about the counterscarp; which might serve them either as lodgments, or as rideaux, to facilitate the carrying on their trenches, and planting their batteries against the place. Such are ravelins, tenailles, horn-works, queue d'arondes, envelopes, crown-works. The most usual of these are ravelins, or half-moons, formed between the two bastions, on the flanking angle of the counterscarp, and before the curtain, to cover the gates and bridges.

OUVERTURE. See *OVERTURE*.

OVUM ANGUINUM, a name given by many authors to a fossil, supposed by the vulgar to be the petrified egg of a serpent, but being really like the brontia and ombria, species of the echinites.

This some have supposed to be a bead of glass, used by the Druids to impose upon the vulgar, whom they taught to believe that the possessor would be fortunate in all his attempts, and that it would give him the favour of the great. See *ANGUINUM Ovum*.

OVUM *Philosophicum*, or *Chymicum*, is a glass body of an oval form, resembling an egg: used for the sublimation of mercury.

OVUM *Polypi*, in *Natural History*, a name given by some of the earlier writers to the papyraceous or thin-shelled nautilus. The resemblance of the body and arms of the fish which inhabits this shell, with those of the sea-polypus, gave occasion to their supposing this creature the same animal, not yet got out of the egg. The shell of this species being very thin, and looking like an egg-shell, gave farther countenance to this error in less knowing ages.

OVUM *Rumphii*, the name of a species of porcelain shell, of the oblong kind, called an *egg*, from its shape, by that author. See *PORCELAIN Shell*.

OVUTSI, or OUVUSTI, in *Geography*, a town of Japan, in the island of Xicoco. N. lat. 34° 8'. E. long. 135° 20'.

OUZE, in *Agriculture*, a sort of deposit made by the sea, which is often very sterile and unproductive, but sometimes the contrary.

OUZELL, BROOK, in *Ornithology*. See RALLUS *Aquaticus*.

OUZELL, Ring. See TURDUS *Torquatus*.

OUZELL, Rose or Carnation-coloured. See TURDUS *Roseus*.

OUZELL, Water. See STURMUS *Cinclus*.

OUZOUER *sur Loire*, in *Geography*, a town of France, in the department of the Loiret, and chief place of a canton, in the district of Gien; 6 miles S.E. of Gien. The place contains 686, and the canton 5564 inhabitants, on a territory of 275 kilometres, in 8 communes.

OW, or AWE, *Loch*, a lake in Argyleshire, Scotland, extends about thirty miles in length, and is in some places two miles broad; but its usual width does not exceed one mile. It is an uncommonly fine expanse of water, and little inferior to loch Lomond in the beauty of its scenery. A great part of its banks exhibits lofty mountains covered with wood; and within its bosom are many little islands ornamented with trees and picturesque ruins. On Inish-Chonnell are the remains of an ancient castle belonging to the Argyle family; and on Troach-Elan are vestiges of another fortress, which was granted, with some contiguous lands, to the chief of the clan of Mac-Naughton, by king Alexander III., on condition that he should entertain the Scottish monarch whenever he passed that way. At a more remote period this latter island was the Hesperides of Scotland, and the fatal attempt of Troach, to gather its delicious fruit for his beloved Mego, is handed down from age to age in a beautiful Celtic tale, after the manner of Ossian. "The fair Mego longed for the delicious fruit of the isle guarded by a dreadful serpent. Troach, who had long loved the maid, goes to gather the fruit. By the rustling of the leaves the serpent was awaked from his sleep. It attacked the hero, who perished in the conflict. The monster was also destroyed. Mego did not long survive the death of her lover."

The surface of Loch-Awe is 108 feet above the level of the ocean. Numerous rivulets discharge themselves into it on both sides, and, what is unusual, it receives a large stream at each extremity, emptying itself laterally by the river Awe into loch Etive, an arm of the sea to the north, at a place called Bunaw. This lake abounds with salmon, trout, and char. Eels are likewise extremely plentiful, but held in great abhorrence by the natives, who regard them as water serpents, and unfit for the food of man.

On a rocky point, projecting into the lake, near its eastern end, are seated the venerable ruins of Castle-Kilchurn, which was built in 1440, by the lady of sir Colin Campbell, knight of Rhodes, and ancestor of the Breadalbane family, while her husband was engaged in the holy wars. Since that period, however, many additions have been made to its original extent, by successive possessors. In 1745, it was fitted up for the reception of a royal garrison to secure the peace and tranquillity of the country, but its massive walls are now rapidly falling to ruin, and offer to the contemplative mind a melancholy monument of the mutability of earthly grandeur, and of the unavoidable decay of the most durable works of human art. Beauties of Scotland, vol. v. Pennant's Tour in Scotland, 4to. 1790.

OWANTY, a town of Lithuania, in the palatinate of Wilna; 16 miles E. of Wilkomierz.

OWARI, a town of Japan, in the island of Nippon,

situated in a bay to which it gives name. N. lat. 35° 30'. E. long. 137° 50'.

OWASCO, a lake of America, partly in the towns of Aurelius and Scipio, in Onondago county, New York, about 11 miles long and one broad; communicating with Seneca river on the N. by a stream which runs through the town of Brutus.

OWCE, in *Agriculture*, a provincial word applied to the ox.

OWCH, in *Geography*, a town of Turkestan, on a river which runs into the Sihon; 30 miles S.S.E. of Andagan.

OWCZE, a town of Poland, in the palatinate of Poldia; 40 miles W. of Kaminiac.

OWEGO, a post-town of America, in Tioga county, New York, on the N.W. bank of the E. branch of the Susquehannah; 30 miles W. of Union, at Tioga point, containing 1284 inhabitants.

OWEGO *Creek*, a creek of Tioga county, which serves as the E. boundary of the township of its name.

OWELTY, or OVELTY of Services, in our *Law Books*, an equality of services; as when the tenant paravail owes as much to the mesne, as the mesne does to the lord paramount.

OWEN, JOHN, in *Biography*, a learned English non-conformist divine of the independent denomination, was descended from a respectable family in North Wales, and born in 1616, at Hadham in Oxfordshire. At Oxford he received his grammatical learning, and so rapid was the progress which he made, that at twelve years of age he was admitted a student at Queen's college. He pursued his studies with incredible diligence, allowing himself, for several years, not more than four hours sleep in a night. He was, at the same time, exceedingly attentive to his health, and occasionally indulged in such recreations as were proper for so robust a constitution as he enjoyed, such as leaping, throwing the bar, ringing of bells, and similar hardy exercises. He was admitted to the degree of B. A. in 1632, and commenced M. A. in 1635. Soon after this, archbishop Laud having enjoined the observance of some new regulations with which Mr. Owen was dissatisfied, he refused submission to them. This conduct greatly offended his uncle, to whom he was already under important obligations for maintaining him at college, and to whom he looked for future assistance. Being suspected of favouring Puritanism, many of his best friends abandoned him, and in 1637 his situation at college was rendered so uneasy, that he found himself obliged to leave it. He was now ordained priest, and became chaplain to sir Robert Dormer of Ascot in Oxfordshire, as well as tutor to his eldest son. Afterwards he was appointed chaplain to lord Lovelace, in whose family he resided at the commencement of the civil wars, when he openly avowed himself a friend to the parliamentary cause. This conduct was so highly resented by his uncle, who was a zealous royalist, that he immediately discarded him, settled his estate upon another person, and died without bequeathing him any thing. Lord Lovelace, though he had joined the king's party, continued to treat his chaplain with great civility; but when that nobleman went into the army, Mr. Owen left his house, went to London, and became a perfect convert to the principles of the non-conformists. Mr. Owen first made himself known as an author in 1642, by a work entitled "A Display of Arminianism," which laid the foundation of his future advancement. He was almost immediately presented to the living of Fordham in Essex; and in a short time afterwards to that of Coggeshall. At this latter place he renounced the Presbyterian principles, joined the

the Independents, and formed a church, according to their system of discipline. Upon the prevalence of the independent party, he was sent to preach before the parliament on one of the fast-days in 1646. On this and other occasions Mr. Owen's services were so acceptable to the Commons, that he was afterwards frequently appointed to preach before them, and became the favourite of Fairfax and Cromwell. With the latter he went to Ireland, where he remained a few months, and then returned. He was now called again to preach at Whitehall, and very soon after accompanied the protector into Scotland. In 1651 he was promoted to the deanery of Christchurch college in Oxford; when he went to reside there Cromwell was the chancellor of the university, and he nominated Mr. Owen as his vice-chancellor. In 1653 he was created doctor of divinity by diploma: by virtue of his office as vice-chancellor, he endeavoured to put down habits, formalities, and all ceremonies, notwithstanding he had before taken an oath to observe the statutes, and maintain the privileges of the university. In many respects Anthony Wood speaks very disparagingly, and even contemptuously, of Dr. Owen; but other writers, not disposed to eulogize the doctor, applaud the care which he displayed in maintaining good discipline in the university, and the moderation which he exercised towards the king's party. In 1654, when Cromwell summoned a parliament, Dr. Owen, it is said by Wood, became a candidate for representing the university, and was elected. but sat only a very short time in the house. This circumstance is, however, doubted, inasmuch as it is not referred to by Calamy and other historians of that period. When Richard Cromwell succeeded his father as chancellor of the university, Dr. Owen was removed from the post of vice-chancellor, as he was from Richard's favour when he became protector: this is attributed chiefly to the hostility of the Presbyterian party. Dr. Owen was, indeed, one of the leading men in the assembly of the Independents, which met at the Savoy in October 1658, and he had a principal share in drawing up a confession of their faith and discipline, in opposition to the Presbyterians. While steps were pursuing to bring about the restoration in 1659, he was ejected from the deanery of Christchurch; upon which he retired to Hadham, where he purchased a good estate with a handsome house. Here he lived for some time, preaching in private to many friends, who came from Oxford to hear him, till he was driven away by the soldiery. He now removed from place to place, till at length he arrived in London, where, by one of his publications, he became noticed by the lord chancellor Clarendon, who offered to give him preferment, provided he would conform to the church, which the doctor thought proper to decline. From the interruptions to which he was frequently subject, he prepared to embark for New England, but was stopped by an express order of council. He, about the same time, received an offer of a professorship of divinity in the United Provinces, which he declined. He continued preaching in a private manner as long as he was able, though it was frequently at the risk of his personal safety. In the midst of the persecutions of that period, the moderation and learning which he displayed procured for him the respect and esteem of several persons of honour and quality, who took delight in his conversation; particularly of the earl of Orrery and Anglesea, lord Willoughby of Parham, lord Berkeley, and sir John Trevor, one of the secretaries of state. What is still more wonderful, the king, and James duke of York, paid him particular attention. In one of his conferences with the king, his majesty assured him that he was a friend to liberty of conscience, and was sensible that the dissenters had met with injurious treatment, at the same time presenting him with a

thousand guineas to distribute among those who had suffered most by the late severities, which royal donation the doctor received with thankfulness, and applied with the greatest fidelity. Dr. Owen died at Ealing on the 24th of August 1683, in the 67th year of his age. Dr. Owen was tall and graceful in person, of a grave and majestic countenance, and he possessed a genteel deportment and manners. His temper was serene and even, his disposition liberal, generous, and friendly, and his conduct in the domestic relations was peculiarly amiable and affectionate. Of his ardent and unaffected piety, and of his firm and undeviating integrity, his whole history affords sufficient evidence. His works are numerous; the chief are "An Exposition of the Epistle to the Hebrews," 4 vols. fol.; "Discourse on the Holy Spirit;" "Treatise on Original Sin." All his various writings amount to seven vols. in folio, twenty in quarto, and about thirty in octavo. To his great learning and almost unceasing industry, his works bear abundant evidence. Dr. Calamy says, "he was a man of universal reading, and had digested it. He was especially conversant in those sciences that are assistant to divinity, and master of them in an unusual degree. He was reckoned the brightest ornament of the university of Oxford." But another biographer says, "he was a perfect master of the Latin, Greek, and Hebrew tongues. He was a great philosopher, and also well read in the civil law. A great historian, having a perfect comprehension of church history in particular. He was thoroughly versed in all the Greek and Latin poets, well skilled in the rabbis, and made great use of them as there was occasion." Anthony Wood, though he has treated his memory with the most opprobrious language, says, "he had a very graceful behaviour in the pulpit, an eloquent elocution, a winning and insinuating deportment, and could, by the persuasion of his oratory, in conjunction with some other outward advantages, move and wind the affections of his admiring auditory almost as he pleased." Calamy's Ejected Ministers. Biog. Brit. Granger's Biog. Hist. of England.

OWEN, JOHN, was a native of Caermarthenshire, and received his education at Winchester school, under Dr. Bilson. In 1584 he was admitted a fellow of New college, Oxford, where he continued till 1591, when he was appointed master of a school near Monmouth. In 1594 he obtained the mastership of the free-school at Warwick, where he made himself celebrated by his skill in Latin poetry, especially in the epigrammatic kind. He is said to have experienced the poet's fate of perpetual poverty, but he met with a kind friend in bishop and lord-keeper Williams, by whom he was chiefly supported in the later years of his life. He died in 1622, and was buried, at bishop Williams' expence, in St. Paul's cathedral. His epigrams have been collected in twelve books, and have been published several times. It has been said of them, that they are only inferior to those of Martial; but other critics say, that "in some of his pieces he imitates the pointed turn of Martial with success, but the greater number have little to recommend them except the purity and elegant simplicity of the language." Several have been translated into the French and English languages. We shall transcribe the one which is noticed for containing an elegant compliment to sir Thomas Overbury's poem, entitled "The Wife," to which we have before referred. See OVERBURY.

"Uxorem culto describis carmine talem
Qualem oratorem Tullius ore potens;
Qualem describis, quamvis tibi nuberet uxor
Æqualis tali non foret illa virò." Biog. Brit.

OWEN, HENRY, a learned divine of the church of England,

land, was born near Dolgelly, in Merionethshire, in the year 1716. He was instructed in grammar learning at Ruthin school, in Denbighshire, and at the age of nineteen he entered himself of Jesus college, Oxford. Among the favourite subjects of his pursuit, on his entrance upon academic studies, was that of the mathematics, which he prosecuted with great ardour, and the most serious application. Having taken his degrees, he turned his attention to the study of physic. For three years he practised as a physician, which profession he quitted on account of want of health, and then directed his views to the clerical calling. In early life he was chaplain to sir Mathew Featherstonehaugh, who presented him to the living of Torling, in Essex. In the year 1748 he published his "Harmonia Trigonometria, or a short Treatise on Trigonometry." In 1750 he was presented to the rectory of St. Olave, Hart-street, in the city of London, when he resigned his living of Torling; after this he was appointed chaplain to the bishop of Landaff, and in 1753 he proceeded doctor of physic at Oxford. Dr. Owen's next publication appeared in 1755, entitled "Observations on the Scripture Miracles." This was followed, in 1760, by "Observations upon the Four Gospels." His other principal works were, "An Enquiry into the Septuagint Version;" "Sermons preached at Boyle's Lectures," in two vols.; "An Introduction to Hebrew Criticism;" "The Modes of Quotation used by the evangelical Writers explained and vindicated:" in this work the author chiefly examines those quotations which have been introduced by the evangelists, in order to point out the intimate connection between the events of the life of Christ and the prophecies recorded in the Old Testament; and he concludes with proving that the prophecies in question were justly applied to Christ, or that they are to be considered as referring to him, rather than to subjects more nearly connected with the times and the situations of the prophets. Besides the articles already mentioned, Dr. Owen was the author of "A Collation of the Account of the Dedication of the Temple," in Bowyer's and Nichols's "Origin of Printing;" "Remarks on the Time employed in Cæsar's two Expeditions into Britain," in the second volume of the "Archæologia." Dr. Owen had a considerable share in preparing for the public eye Mr. Bowyer's "Conjectures on the New Testament;" and he assisted Mr. Nichols in editing the 4to. edition of Mr. Bowyer's Greek testament in 1783, as we learn from this observation in the inscription of it to Dr. Owen: "Ipsi auxilio concinnatam." He died in the year 1795, in the eightieth year of his age. New Ann. Register.

OWEN, in *Geography*, a town of Wurtemberg; 18 miles S.E. of Stuttgart.

OWEN'S Bay, *St.*, a bay on the W. coast of the island of Jersey, with a town or village of the same name; 6 miles W.N.W. of St. Helier.

OWER-GATE, in *Rural Economy*, a provincial word signifying a stile place, or imperfect gap in a hedge, and also a stepping place over a brook.

OWER-Well, a provincial word applied to a sheep, which gets laid upon its back in a hollow.

OWEY, in *Geography*, a small island of the Atlantic, near the N.W. coast of Ireland. N. lat. $55^{\circ} 3'$. W. long. $8^{\circ} 21'$.

OWHARREE, a harbour on the W. coast of Huahine, one of the Society islands, in the South Pacific ocean. S. lat. $16^{\circ} 54'$. W. long. $151^{\circ} 8'$.

OWHYHEE, an island in the North Pacific ocean, discovered by captain Cook, Nov. 30, 1778. This is the easternmost, and by far the largest of the group called Sandwich islands; it is of a triangular shape, and nearly equilateral. The following particulars relating to this island

are extracted from the account of it by Capt. King, who visited it again after the death of Capt. Cook, in March 1779. (See Cook's Third Voyage, vol. iii.) The angular points make the north-east and south extremities, of which the northern is in N. lat. $20^{\circ} 17'$. E. long. $204^{\circ} 2'$: the eastern in N. lat. $19^{\circ} 34'$. E. long. $205^{\circ} 6'$; and the southern extremity in N. lat. $18^{\circ} 54'$. E. long. $204^{\circ} 15'$. Its greatest length, which lies in a direction nearly N. and S., is twenty-eight leagues and a half, its breadth is twenty-four leagues, and it is about 255 geographical, or 293 English miles in circumference. The whole island is divided into six large districts: Amakooa and Aheedoo, which lie on the N.E. side; Apooa and Koo on the south-east; Akona and Koaarra on the west. The districts of Amakooa and Aheedoo are separated by a mountain, called *Mounah Kaah*, or *The Mountain Kaah*, which rises in three peaks, perpetually covered with snow, and may be clearly seen at 40 leagues distance. To the N. of this mountain the coast consists of high and abrupt cliffs, down which fall many beautiful cascades of water. We were once flattered with the hopes of meeting with a harbour round a bluff head, in N. lat. $20^{\circ} 10'$, and E. long. $204^{\circ} 26'$; but on doubling the point, and standing close in, we found it connected, by a low valley, with another high head to the north-west. The country rises inland with a gentle ascent, is intersected by deep narrow glens, or rather chafms, and appeared to be well cultivated, and sprinkled over with a number of villages. The snowy mountain is very steep, and the lower part of it covered with wood. The coast of Aheedoo, which lies to the south of Mouna Kaah, is of a moderate height, and the interior parts appear more even than the country to the N.W., and less broken by ravines. Off these two districts we cruized for almost a month; and, whenever our distance from the shore would permit it, were sure of being surrounded by canoes laden with all kinds of refreshments. We had frequently a very heavy sea, and great swell, on this side of the island, and as we had no foundings, and could observe much foul ground off the shore, we never approached nearer the land than two or three leagues, excepting on the occasion already mentioned. The coast to the N.E. of Apooa, which forms the eastern extremity of the island, is low and flat; the acclivity of the inland parts is very gradual, and the whole country covered with cocoa-nut and bread-fruit trees. This, as far as we could judge, is the finest part of the island, and we were afterward told, that the king had a place of residence here. At the south-west extremity the hills rise abruptly from the sea-side, leaving but a narrow border of low ground towards the beach. We were pretty near the shore at this part of the island, and found the sides of the hills covered with a fine verdure; but the country seemed to be very thinly inhabited. On doubling the east point of the island, we came in sight of another snowy mountain, called *Mouna Roa*, or *The Extensive Mountain*, which continued to be a very conspicuous object all the while we were sailing along the south-east side. It is flat at the top, making what is called by mariners table-land: the summit was constantly buried in snow, and we once saw its sides also slightly covered for a considerable way down, but the greatest part of this disappeared again in a few days. According to the tropical line of snow, as determined by Mr. Condamine, from observations taken on the Cordilleras, this mountain must be at least 16,020 feet high, which exceeds the height of the Pico de Teyde, or Peak of Teneriffe, by 724 feet, according to Dr. Heberden's computation; or 3680, according to that of the chevalier de Borda. The peaks of Monna Kaah appeared to be about half a mile high, and as they are entirely covered with snow, the altitude of their summits cannot be less than 18,400 feet. But it is probable that both these

mountains may be considerably higher. For, in insular situations, the effects of the warm sea-air must necessarily remove the line of snow, in equal latitudes, to a greater height than where the atmosphere is chilled on all sides, by an immense tract of perpetual snow. The coast of Kaoo presents a prospect of the most horrid and dreary kind: the whole country appearing to have undergone a total change from the effects of some dreadful convulsion. The ground is every where covered with cinders, and intersected in many places with black streaks, which seem to mark the course of a lava that has flowed, not many ages back, from the mountain Roa to the shore. The southern promontory looks like the mere dregs of a volcano. The projecting head-land is composed of broken and craggy rocks, piled irregularly on one another, and terminating in sharp points. Notwithstanding the dismal aspect of this part of the island, there are many villages scattered over it, and it certainly is much more populous than the verdant mountains of Apooa. Nor is this circumstance hard to be accounted for. As these islanders have no cattle, they have consequently no use for pasturage, and therefore naturally prefer such ground as either lies more convenient for fishing, or is best suited to the cultivation of yams and plantains. Now amidst these ruins there are many patches of rich soil, which are carefully laid out in plantations; and the neighbouring sea abounds with a variety of most excellent fish, with which, as well as with other provisions, we were always plentifully supplied. Off this part of the coast we could find no ground less than a cable's length from the shore, with 160 fathoms of line, excepting in a small bight to the eastward of the fourth point, where we had regular soundings of fifty and fifty-eight fathoms, over a bottom of fine sand. Before we proceed to the western districts, it may be necessary to remark, that the whole east side of the island, from the northern to the southern extremity, does not afford the smallest harbour or shelter for shipping. The S.W. parts of Akona are in the same state with the adjoining district of Kaoo; but farther to the north, the country has been cultivated with great pains, and is extremely populous. In this part of the island is situated *Karakakooa Bay*, which see. Along the coast nothing is seen but large masses of slag, and the fragments of black scorched rocks; behind which the ground rises gradually for about two miles and a half, and appears to have been formerly covered with loose burnt stones. These the natives have taken the pains of clearing away, frequently to the depth of three feet and upwards; which labour, great as it is, the fertility of the soil amply repays. Here, in a rich ashy mould, they cultivate sweet potatoes, and the cloth plant. The fields are inclosed with stone fences, and are interspersed with groves of cocoa-nut trees. On the rising ground beyond these the bread-fruit trees are planted, and flourish with the greatest luxuriance. Koaara extends from the westernmost point of the northern extremity of the island; the whole coast between them forming an extensive bay, called *Toe-yab-yab*, which is boarded to the N. by two very conspicuous hills. Toward the bottom of this bay, there is soil, corally ground, extending upwards of a mile from the shore, without which the soundings are regular, with good anchorage, in twenty fathoms. The country, as far as the eye could reach, seemed fruitful and well inhabited, the soil being in appearance of the same kind with the district of Kaoo, but no fresh water is to be got here. A party advanced into the land, to the distance of three or four miles from the bay: they found the country as before described; the hills afterwards rose with a more sudden ascent, which brought them to the extensive plantations that terminate the view of the country, as seen from the ships. These planta-

tions consist of the tarrow or eddy-root, and the sweet potatoe, with plants of the cloth tree, neatly set out in rows. The walls that separate them are made of the loose burnt stones which are got in clearing the ground; and being entirely concealed by sugar canes, planted close on each side, make the most beautiful fences that can be conceived. The party stopped for the night at the second hut they found amongst the plantations, about six or seven miles, as they estimated the distance, from the ships. The prospect from this spot was very delightful; they saw the ships in the bay before them; to the left a continued range of villages, interspersed with groves of cocoa-nut trees, spreading along the sea-shore; a thick wood stretching out of sight behind them; and to the right an extent of ground laid out in regular and well-cultivated plantations, as far as the eye could reach. Near this spot, at a distance from any other dwelling, the natives pointed out to them the residence of an hermit, who, as they said, had formerly been a great chief and warrior, but had long ago quitted the shores of the island, and now never stirred from his cottage. They prostrated themselves as they approached him, and afterwards presented to him a part of such provisions as they had brought with them. His behaviour was easy and cheerful; he scarcely shewed any marks of astonishment at the sight of our people, and though pressed to accept of some of our curiosities, he declined the offer, and soon withdrew to his cottage. He was described as by far the oldest person any of the party had ever seen, and judged to be, by those who computed his age, at the lowest, upwards of 100 years old. Here the travellers found the cold so intense, that they could get but little sleep, and the natives none at all; both parties being disturbed the whole night by continued coughing. This extraordinary rigour of cold was ascribed to the easterly wind, which blew fresh over the snowy mountains. They still proceeded, and entered a thick wood, through which their progress was slow; and after they had advanced about ten miles in the wood, they found themselves, on a sudden, within sight of the sea, and at no great distance from it. They therefore retraced their steps for six or seven miles to an unoccupied hut, where they had left three of the natives and two of their own people, and the small stock that remained of their provisions. Here they spent the second night, suffering much from the intense cold. Their provisions being exhausted, they found it advisable to return to some of the cultivated parts of the island, and quitted the wood by the same path on which they had entered it. Having obtained a fresh supply, they marched along the skirts of the wood for six or seven miles, and entered it again, pursuing their course for the first three miles through forests of lofty spice-trees. In passing through the woods, they found many canoes half finished, and here and there a hut; but saw none of the inhabitants. In their farther progress, they experienced the want of water, as in a course of 20 miles they had met with no springs. In the night the cold was more intense than they had found it before, which prevented their deriving much refreshment from rest and sleep. At length they determined to return to the ships, after taking a view of the country from the highest trees which the place afforded. From this elevation they saw themselves surrounded, on all sides, with wood towards the sea; they could not distinguish, in the horizon, the sky from the water; and between them and the snowy mountain, which they had once intended to ascend and examine, was a valley about seven or eight miles broad, above which the mountain appeared only as a hill of a moderate size. Finding themselves about 9 miles N.E. of the ships, they directed their march toward them through the plantations.

As they passed along, they did not observe a single spot of ground, that was capable of improvement, left unplanted; and, indeed, it appeared from their account hardly possible for the country to be cultivated to greater advantage for the purposes of the inhabitants, or made to yield them a larger supply of necessaries for their subsistence. They were surprised to meet with several fields of hay; and on enquiring to what use it was applied, were told, it was designed to cover the young tarrow grounds, in order to preserve them from being scorched by the sun. They saw a few scattered huts among the plantations, which served for occasional shelter to the labourers; but no villages at a greater distance than four or five miles from the sea. It was on this island that the celebrated captain Cook fell a sacrifice to a misunderstanding, or sudden impulse of revenge, in the natives, on Sunday the 14th of February, 1779. See his biographical article.

OWL, in *Ornithology*. See STRIX.

OWL, *Churn*. See CAPRIMULGUS *Europæus*.

OWL *Fish*, or *Sea Owl*, in *Ichthyology*, an English name for the lumpus, more frequently called the *lump-fish*; and by the Scotch the *lock-paddle*. See CYCLOPTERUS *Lumpus*.

OWL *Pigeon*, in *Ornithology*, the name of a particular species of pigeon, called by Moore the *columba bubo nominata*. It is a small and short-bodied pigeon; it has a short round head, and has a series of feathers that separate and open two ways upon the breast: but its most remarkable character is its beak, the upper chop of which is bent, and hooked over like an owl's: this is the occasion of its name. It is of various colours, as white, blue, or black, but is always of one colour, never pied.

OWL's *Head*, in *Geography*, a cape on the S.E. coast of Nova Scotia. N. lat. 44° 42'. W. long. 66° 50'.

OWLAK, a town of Hindoostan, in Rohilcund; 12 miles E. of Bissowia.

OWLER, a master of a ship, or other person, who conveys wool, or other prohibited goods, in the night, to the sea-side, in order to ship them off contrary to law.

The name is derived hence, that like owls they only stir abroad in the night-time.

OWLING, in *Law*, so called from its being usually carried on in the night, denotes the offence of transporting wool or sheep out of this kingdom, to the detriment of its staple manufacture. This was formerly by common law (Mir. c. 1. § 3.), and more particularly by statute 11 Edw. III. c. 1. when the importance of our woollen manufacture first became an object of attention; and there are now many later statutes relating to that offence, the most useful and principal of which are those enacted in the reign of Elizabeth and since. The statute 8 Eliz. c. 3. makes the transportation of live sheep, or embarking them on board any ship, for the first offence, forfeiture of goods, and imprisonment for a year, and that at the end of the year the left hand shall be cut off in some public market, and shall there be laid up in the most open place; and the second offence is felony. The statutes 12 Car. II. c. 32. and 7 & 8 W. III. c. 28. make the exportation of wool, sheep, or fuller's earth, liable to pecuniary penalties, and the forfeiture of the interest of the ship and cargo by the owners, if privy; and confiscation of goods, and three years' imprisonment to the master and all the mariners. And the statute 4 Geo. I. c. 1. (amended and further enforced by 12 Geo. II. c. 21. and 19 Geo. II. c. 34.) makes it transportation for seven years, if the penalties be not paid.

OWNER, the proprietor of a ship, by whom she is freighted to the merchant for conveyance by sea.

OWRUCZE, in *Geography*, a town of Lithuania, in the palatinate of Kiev; 96 miles N.W. of Kiev.

OWSCRAW, a town of Hindoostan, in Bahar; 20 miles W. of Rotas.

OWSE, among tanners, is oaken bark, beaten or ground small to serve in the preparation of leather.

OX, Bos, in *Zoology*, a genus of the *Mammalia Pecora*, the characters of which are that it has hollow persistent horns, which are smooth, and bend outwards and forwards in a semilunar form. It has eight cutting teeth in the lower jaw, none in the upper, and no tusks. The animals of this genus are extremely useful to mankind, serving as beasts of draught and burden, and furnishing for food beef, milk, cheese, butter, curds and whey; their skins make excellent leather for many purposes (see HIDE); the fat is used for making soap and candles; the horns are manufactured into a variety of useful utensils; and even the hoofs, bones, and hair are converted to use. They principally delight in flat pastures, avoiding woods and steep hills; they fight by pushing with their horns; their voice is denominated "lowing" or "bellowing;" the male is called *Bull* (which see); when emasculated, ox: the female, *Cow* (which see); when spayed, heifer; the young *Calf* (which see); and, like the sheep, it has various appellations for different ages and circumstances, as steer, stot, runt, keillie, stirk, seg, and many others, which vary in different districts.

The common ox, or *Bos taurus*, has round horns, which are curved outwards; and a pendant dewlap. This species inhabits almost every part of the world, either in a wild or domesticated state. It is subject to great variety in form, colour, and figure of the horns. For the varieties, both of the wild and domesticated ox or bos, and other species; see TAURUS.

Ox, in *Rural Economy*, the name of a well-known animal, produced from the male of the cattle kind by castration. See CATTLE.

Oxen, like other domestic animals, vary much in colour; but whatever be the colour, it should be glossy, thick, and smooth to the touch; for if it be harsh, tough, or thin, there is reason to suppose that the animal is out of order, or at least not of a strong constitution.

Mr. Marshall made many experiments on the utility of oxen in the plough, and strongly recommends the use of them for most draught purposes, as no horses draw better. He remarks that full-grown oxen in general are much longer made than horses, too long for common shafts, not having room to back the cart; for which reason the shafts should be made long enough to admit them. Ox-collars are strongly recommended. See COLLARS.

The comparative merits and demerits of beasts of labour, depend, in his opinion, on their first cost, their keep, their work, and their value after working. A powerful, handsome, six-years'-old ox, might formerly be purchased for ten or twelve guineas; but a powerful, handsome, six-years'-old horse, would cost from twenty to twenty-four guineas. Suppose that ten guineas a-head are saved by purchasing oxen instead of horses, and that a farmer has occasion for three teams, he will have an addition, every ten or twelve years, of one hundred and twenty guineas to stock and manage his farm with. Their keep depends, in some measure, on the prices of hay and corn, and on the size and voraciousness of the beast to be fed. Taking into the account the unavoidable pilfering of carters, perhaps, on an equality of time, an ox may be kept at two-thirds of the expence of a large cart-horse. In their work, it is unnecessary here to contend for superiority, but you may aspire at equality. Oxen are equally tractable and equally versatile. Their strength depends

depends upon their age and breed, and their activity on their make and strength. A two-years'-old ox is as worthless in work as a two-years'-old horse; and the working of either is unpardonable. An ox does not arrive at full strength, especially if worked while young, until he be six years old. At that age, a large deep-chested ox is equal in strength to a strong well-made cart-horse. Mr. Marshall adds, that he is not so partial to oxen as to imagine that they can do whatever horses can do: he is nevertheless nearly positive, that whatever farming horses do, oxen (of a proper age and properly managed) can do. On the road they are, beyond all doubt, equal to horses, and at plough they are not inferior, except their work be very heavy. In heavy work they will not strive like horses, but will, in defiance, keep their steady pace. In this point of view, and in this only, oxen are unequal to horses. Indeed he never worked oxen all the year round, as horses are done, but he has always given them a month's marshing in the spring, and they have generally had some idle days in the winter; their fodder, however, in this case, has been proportionable.

In the Rural Economy of Yorkshire, the long agitated dispute about the superiority of oxen or horses, as beasts of draught, may be considered with singular propriety. But he is afraid even this county will not furnish us sufficient evidence for final decision.

"Formerly, and from time immemorial, four or six oxen in yokes, led by two horses, also double, were the invariable draught or team of the country; not only upon the road, but in ploughing. Even in stirring a fallow, four oxen and two horses were generally considered as requisite. And in breaking up a fallow, two men and a boy were the common attendants of this unwieldy, expensive team.

"At present, there is not perhaps, throughout the vale, a single ox employed in tillage: two horses with whip reins, without a driver, is now the universal plough-team for all soils, in almost every state.

"Upon the road, however, that is to say, in farm carriages, oxen are still in use; but seldom more than a single pair to a carriage; generally at the pole, with two or three horses at length before them. Beside, a number of entire horse-teams now travel upon the road; things which were formerly unknown in the country.

"Even the timber-carriers (an industrious wary set of men) continue to use them; though their sole employment be upon the road. They not only find them able to stand working every day, provided their feet do not fail them: but, what is much in their favour, they are found to stand long hours better than horses going in the same pasture. An ox in a good pasture soon fills his belly, and lays himself down to rest; whereas a short summer's night scarcely affords a horse time enough to satisfy his hunger.

"Another advantage of oxen is here held out. In stiff pulls of every kind, most especially in going up steep hills, a pair of oxen is considered as a sheet anchor. Horses, it is agreed, are fearful, and soon lose their feet in a steep slippery road; while oxen, where they are unable to proceed, will always stand their ground. Indeed, oxen seem to be considered as essentially necessary in an awkward hilly country.

"If we had no other species of animals adapted to the purpose of draught in the island, nor any one which could be naturalized to the climate, cart-horses would be truly valuable; they being much superior to the breed of saddle-horses for the purposes of draught.

"But it appears to him evident, from the experience he has had, and the observations he has made, that were only a small share of the attention paid to the breeding of draught oxen, which now is bestowed on the breeding of cart-horses;

animals equally powerful, more active; less costly; equally adapted to the purposes of husbandry (if harnessed with equal judgment); less expensive in keep and attendance; much more durable; and infinitely more valuable after they have finished their labours; might be produced."

An ox is to draw the plough only from his third to his tenth year, when it will be advisable to fatten and sell him, as being then of a better flesh than if he was kept longer. The age of this creature is known by his teeth and horns. The first fore-teeth, which he sheds at the end of ten months, are replaced by others, larger, but not so white; at six months the teeth next to those in the middle fall out, and are also replaced by others; and in three years all the incisive teeth are renewed. They are then equal, long, and pretty white; but as the ox advances in years, they wear, become unequal, and black. It is the same in the bull and cow: so that the growth and shedding of the teeth are not affected by castration, or the difference of sexes. Nor is the shedding of horns affected by either; as both bull, ox, and cow, lose them alike at the end of three years; and these also are replaced by other horns, which, like the second teeth, remain; only those of the ox and cow are larger and longer than those of the bull. The manner of the growth of these second horns is not uniform, nor the shooting of them equal. The first year, that is the fourth of the ox's age, two small pointed horns make their appearance nearly formed, smooth, and towards the head terminated by a kind of button. The following year, this button moves from the head, being impelled by a corneous cylinder, which also lengthening, is terminated by another button; and so on; for the horns continue growing as long as the creature lives. These buttons become annular joints, which are easily distinguished in the horn, and by which the age of the creature may be readily known; counting three years for the point of the horn to the first joint, and one year for each of the other intervals. See *AGE of Neat Cattle*.

The writer of a late treatise on cattle suggests, that "as a labouring animal, for agricultural purposes, he is, on the whole, far superior to the horse. This important position has been so repeatedly and irrefragably proved, that it ought, at this period, to be fully sufficient to make the assertion to be no otherwise disproved than by a fair adduction of equivalent and contrary facts. If we can produce, in the ox, strength and weight enough for the heaviest, with speed sufficient for the lightest soils, and those joined with the highest degree of docility and resolution, what would the husbandman more? Let him, under these circumstances, make his calculation between the value of those benefits to be derived from the labour of the horse and the ox, taking into the account the less expensive keep of the latter, even when corn-fed, and that the profits of breeding and training for sale the labouring ox would probably equal the similar transactions with the horse." It is added that the blundering absurdities published by theoretical advocates for ox-labour have served to mislead many, and to bring infinite prejudice to the cause. We have been gravely instructed, that the ox is fitted for the labours of tillage, 'by the unwieldy magnitude of his body, the slowness of his paces, and the shortness of his legs!' the very qualities which render him so totally unfit for the purpose, any otherwise than as a wretched substitute, and which affords the horse so manifest a superiority over him. Oxen of this description could only be advantageous for the labours of the field, in times anterior to the great improvements of horses, and the present character of the British labouring ox, is a direct reverse of the picture." And we may even go farther, and assert, without the smallest impropriety, that we possess breeds of neat cattle in this country, well qualified, from

from their considerable powers of progression, for the ordinary purposes of quick draught, carrying of burdens, or even for the saddle. Such are the Devons, Glamorgans, and the lightest of the Suffex cattle. It is not improbable, that some of these are able to trot seven or eight miles within the hour. Three or four years since, a Suffex ox ran four miles over Lewis course, for a hundred guineas, which he performed after the rate of fifteen miles *per* hour. Custom alone renders the use of bullocks for the saddle and the coach unapproved and unnoticed, or strange and ridiculous. Over great part of Asia, immemorial usage has established the propriety of employing oxen in both these capacities. They have, it is true, in those countries, the bison and the zebu, a species of oxen superior to our's in activity and facility of progression, but the comparison only proves these inferior, by no means useless, even for quick draught. Were it really an object with us to make use of bullocks in this way, there can be no doubt of its success, if aided by an increased attention to their breed and training, and a due measure of that liberal treatment which they are accustomed to receive in India, where their travelling oxen are curried, clothed, and attended with as much solicitude, and much greater kindness, than we bestow on our best horses. The Indian cattle are extremely docile and quick of perception, patient and kind; like the horse, their chief travelling pace is the trot, and they are reported by those who have ridden them, often to perform journeys of sixty successive days, at the rate of thirty to forty-five miles *per* day. It ought not to be forgotten in favour of the ox, that, like the generous horse, he is honest to the last, and never stops, or shews muleish or asinine restlessness and disobedience."

It is likewise stated that "much is said in favour of the mule and the ass, on account of the duration of their labour to so late a period, and a superiority thence challenged for the mule, even over the horse; but with the ox age seems to form no question, he may, with the utmost truth, be said never to grow old, since his last value is superior to his first, and since the keeping of his successor is, in every view, a benefit to a man, being an animal which exhausts not like the horse, but manures and improves the land on which he is fed and supported."

The largest oxen are to be chosen for work and for feeding, but then it must be where there is land rich enough to maintain them. When they are to draw, care must be taken to match them well, both for height and strength; for if one be stronger than the other, the weakest will soon be destroyed. They must never be driven beyond their natural pace, for the beating of them throws them into surfeits, and many other diseases. The time of putting oxen to work is at three years old; they must be worked gently the first year, especially in hot weather, and fed with a large quantity of hay: this will enable them to bear their labour better than grass; and they should always be kept in a middle state, neither too fat nor too lean. They may be worked till they are ten or twelve years old, and then sold.

It is observed, that meat and fair treatment succeed much better with this animal than blows. The best way to break a young one to the yoke is to put him to it with an old tame ox of about his own height and strength. If he prove unruly after this, he must be kept hungry, and made to feed out of the driver's hand. Oxen are much more profitable to keep than horses, there being no loss in them: and an old wrought ox fattening as well as a young one, and being as good meat. Their keeping also is cheaper, for they eat no oats; their harness and their shoes also are considerably cheaper, and they are not so subject to diseases. They must always indeed have good grass and good hay,

and they are not so serviceable as horses, when there is much working in carts, and where the ways are good; but for winter ploughing, where the ground is heavy, an ox will do as much work as a horse.

Every farmer, who can keep two teams, would do wisely to have one of them of horses, and the other of oxen; it is much better to yoke them together by the necks and breasts, than by the horns, as some do; and where a man keeps an ox-team, he should raise two oxen and two ewe calves every year, to keep up his stock; for it is better for a farmer, in all necessary things, to be a seller than a buyer. Chalky lands spoil the feet of oxen more than any other. See TEAM.

Stealing oxen, or creatures of the ox kind, old or young, whether bull, cow, &c. strictly so called, steer, bullock, heifer, or calf, is now felony without benefit of clergy; as is likewise killing any of these, with an intent to steal any part of their ear-cases. Stat. 15 & 16 Geo. II. cap. 34. and stat. 14 Geo. II. cap. 6. See CATTLE.

Ox-Bird, in Ornithology. See TANTALUS *Ibis*.

Ox-Eye. See CERTHIA.

Ox-Eye. See FRINGILLAGO.

Ox-Eye, in Botany. See BUTHIALMUM.

Ox-Eye Daisy. See CHRYSANTHEMUM.

Ox-Eye, in Sea Language, a name given by the seamen to those dreadful storms that are sometimes met with on the coast of Guinea; for at first it appears in the form of an ox's eye, and not much bigger; but it descends with such celerity, that in a very little space of time, and often before they can prepare themselves for it, it seems to them to overspread the whole hemisphere; and at the same time forces the air with so much violence, that the ships are sometimes scattered several ways, some directly contrary, and sometimes are sunk downright.

Ox-Eye, in Optics. See SCIOPTIC and CAMERA *Obscura*.

Ox-Fly, in Natural History, a species of two-winged fly, bred from a fly-worm, hatched under the skin of oxen, from the egg of the parent fly lodged there.

The female of this fly makes a number of small wounds in the backs of the horned cattle, and in each of these deposits an egg: which is afterwards hatched by the warmth of the creature's body. As soon as hatched, the young worm finds itself in a very convenient lodging, and in a way to be furnished with all the necessaries of life.

The places where they lie are easily discovered, as there is ever a tumour about them, like that on the fore-heads of children from falls; within this, and under the thick skin of the creature, is the worm lodged. The country-people know very well that a worm is contained within each of these tumours, but they are somewhat mistaken as to the fly it comes from; the gad-fly being the most busy about these creatures, and giving them most vexation, they naturally enough have supposed this the produce of the egg of that fly; but this is an erroneous opinion: Mr. Valisnieri seems the first who understood the true state of the case, and he has given a very full and excellent account of it. See BOTTS and OESTRUS.

Ox-Lips, in Botany. See PRIMULA.

Ox Mountain, in Geography. a mountain of Ireland, in the county of Sligo, ten miles W.S.W. of Sligo.

Ox-Tongue, in Botany. See PICRIS.

OXALATS, in Chemistry, are combinations of the oxalic acid with the bases of salts. See the bases respectively.

OXALIC ACID, a vegetable acid, naturally formed in the oxalis acetosella, or wood sorrel, from which it takes its name.

OXALIC ACID.

It has been discovered by Scheele, that this acid can be formed by the action of nitric acid upon sugar, and several other vegetable substances. The merit of this discovery was formerly given to Bergman, who first published the method of preparing it.

In order to form this acid with sugar and nitric acid, let one part of the former be put into a glass retort with three parts of the acid of the specific gravity 1.5, and a gentle heat applied: in a short time a brisk effervescence ensues, caused by the rapid escape of nitrous gas and carbonic acid. This process is to be continued till the effervescence ceases, and the red fumes disappear; three parts more of nitric acid are then to be added, when a fresh but less violent action will take place, this being continued till the fumes cease, and the liquid becomes colourless. It may now be left to cool, when crystals of oxalic acid will be deposited. If the remaining liquor be again treated with nitric acid, it will be rendered capable of affording more crystals. When the crystals are separated, they should be dissolved in distilled water, and crystallized a second time, and in some cases a third crystallization may be necessary. When they are of a pearly white colour, they may be deemed pure oxalic acid. At first view the crystals appear like a mass of needles, but upon close examination they will be found to be four-sided prisms. They are exceedingly sharp and acrid to the taste. They dissolve in their own weight of boiling water, and in twice their weight of water, at 60°. The solution, when sufficiently diluted, has an agreeably acid taste. One part of boiling alcohol dissolves .56 of oxalic acid. It changes vegetable blues to red, and one part gives a sensible acidity to .2633 of water. The crystallized acid, according to Dr. Thomson, consists of 77. real acid and 23 water. The crystals are not changed by exposure to the air. When exposed to heat it gives out disagreeable pungent fumes of a white colour. It would appear that in this change the water of crystallization escapes, carrying off a portion of the acid, for the residuum is whiter than the crystals, and the water is reabsorbed from the atmosphere, giving it its original properties. When exposed to distillation it first undergoes the change above-mentioned. A portion of the acid is sublimed without alteration. The remainder is decomposed, affording a dark coloured residuum, carbonic acid, carburetted hydrogen, and probably carbonic oxyd.

It oxydates most of the metals, as gold, platina, silver. Mercury and several others are exceptions.

It combines with the alkalis, earths, and metallic oxyds, forming salts called oxalates.

Although the acid has been formed in the presence of nitric acid, yet when it is heated with fresh strong acid, mutual decomposition takes place, and the oxalic acid is converted into carbonic acid and water.

The sulphuric acid partly decomposes it when heat is applied, but the change appears to be similar to that produced by heat alone.

The muriatic acid dissolves it without changing its properties.

The constituents of this acid, as well as the rest of the vegetable acids, have not as yet been determined with precision.

An analysis, given by Fourcroy and Vauquelin, determines it as follows:

Oxygen	77
Carbon	13
Hydrogen	10
	<hr/>
	100
	<hr/>

A more recent analysis, by Dr. Thomson, states it to consist of

Oxygen	64
Carbon	32
Hydrogen	4
	<hr/>
	100
	<hr/>

This last is nearer the truth. We have, however, a still later analysis by Gay Lussac and Thenard, by a new mode of operating, with hyper-oxymuriat of potash. The proportions determined by these last chemists are,

Oxygen	70.69
Carbon	26.59
Hydrogen	2.72
	<hr/>
	100.
	<hr/>

In these experiments, upon analysis, it will be more certain to operate upon some of the oxalates, rather than upon the free acid, except its water of crystallization could be accurately determined. Another objection is its subliming before it is decomposed, which is not the case when the acid is combined. The oxalat of lime has been employed for this purpose. The oxalates of lead, mercury, and perhaps silver, might be employed to advantage when they are well defined.

This, like all other chemical compounds, must be constituted by limited proportions of its elements, which are oxygen, hydrogen, and carbon. It appears, from the proportion in which it combines with the different saline bases, to have the lightest atom of any of the vegetable acids. If we call hydrogen 1, its atom is about 20.

The atom of sugar, according to a late analysis by Gay Lussac and Thenard, is 50 oxygen, 42 carbon, and 6.96 hydrogen. This nearly agrees with one atom of each. We have seen that oxalic acid is formed by the mutual decomposition of sugar and nitric acid. Although in this decomposition carbonic acid is evolved, it does not appear that its evolution is essential to the formation of oxalates. If the process could be so conducted that an atom of oxygen might be transferred from an atom of nitric acid to an atom of sugar, it would form an atom of oxalic acid, while an atom of nitrous gas escapes. The atom of oxalic acid may, therefore, be regarded as constituted by an atom of sugar and an atom of oxygen; the first being 5.4 of carbon, 7 of oxygen, and 1 hydrogen. This, added to an atom of oxygen from the acid, will be $5.4 + 2 \times 7 + 1 = 20.4$ the atom of oxalic acid. From these data its proportions *per cent.* will be

Oxygen	68.6
Carbon	26.5
Hydrogen	4.9
	<hr/>
	100.
	<hr/>

This agrees remarkably with the last analysis by the French chemists.

From the numbers which may be given to the citric and tartaric acids in their saline combinations, the former being about 34, and the latter 45, we may presume the citric acid to be formed by 2 atoms of sugar and 1 of oxygen, which will give $(7 + 5.4 + 1) \times 2 + 7 = 33.8$. The tartaric acid appears to consist of 3 atoms of sugar with 1 of oxygen, or $(7 + 5.4 + 1) \times 7 = 47.2$.

The oxalic acid is principally used as a chemical agent.

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From

From the very insoluble compound which it forms with lime, it is a valuable test of the latter substance. It must, however, be observed, that the super-oxalat of lime is soluble, hence the acid should not be used in excess. The proper way is to use the oxalat of ammonia.

It has the property of dissolving the red oxyd of iron in common with the citric and tartaric acids, but in a greater degree. If it could be made cheap, it would be a valuable acquisition to the calico printers.

OXALIS, in *Botany*, from *οξύς*, *four*, a name adopted from the Greeks; whose *οξύς*, however, is probably the *Acetosa* of the Latins, and belongs to the genus *Rumex*; the genus of which we are to treat being scarcely discoverable in the writings of the ancients, and the first of its species which drew the attention of the earlier modern botanists, having been called in their works by various names of their own invention, not worth scrutinizing. Possibly this may be the *Oxys* of P'ny, which he says bore ternate leaves, and was given to persons with weak stomachs.—Linn. Gen. 231. Schreb. 311. Willd. Sp. Pl. v. 2. 772. Mart. Mill. Dict. v. 3. Sm. Fl. Brit. 491. Ait. Hort. Kew. ed. 2. v. 3. 116. Juss. 270. Lamarck Illustr. t. 391. Gært. t. 113. (*Oxys*; Tourn. t. 19.)—Class and order, *Decandria Pentagynia*. Nat. Ord. *Gerania*, Juss. Rather perhaps allied to his *Rutaceæ*.

Gen. Ch. *Cal.* Perianth of five, rather short, permanent leaves. *Cor.* Petals five, obovate, obtuse, emarginate, spreading; their claws erect, and often cohering. *Stam.* Filaments ten, erect, awl-shaped, the five alternate ones shortest, all frequently combined at the bottom, the longest sometimes furnished with a prominent tooth; anthers versatile, elliptical, two-lobed, furrowed. *Pist.* Germen superior, with five angles; styles five, thread-shaped, various in length with regard to the stamens; stigmas obtuse. *Peric.* Capsule membranous, with five angles, five cells, and five valves, bursting longitudinally at the angles. *Seeds* one or more in each cell, roundish, slightly compressed, polished, widely dispersed, by means of a bivalve elastic tunic.

Ess. Ch. Calyx of five leaves. Petals five, connected by their claws. Stamens unequal, partially combined at the base. Capsule superior, of five cells, bursting at the five angles. Seeds with an elastic tunic of two valves.

This curious and pretty genus, of which only 13 species are found in the first edition of the *Species Plantarum*, is augmented to twice that number in *Syst. Veg.* ed. 14. The discoveries of recent botanists, at the Cape of Good Hope, have added a much greater number to the original stock. Jacquin, in a valuable quarto monograph on the genus, describes 96. Willdenow reduces them to 93, and of these 58 are, or have been, cultivated in the Royal Gardens at Kew. Two are natives of Britain; 13 of America; one of the East Indies; the rest of the Cape of Good Hope. Nearly all the latter perhaps have bulbous roots, and grow in sandy ground, flowering after the rainy season, their economy being like that of the Cape bulbs, properly so called, which belong to the natural order of *ENSATÆ*. (See that article.) In England they may be preserved in the greenhouse, and will blossom either very late in autumn, or early in the spring. After flowering, the pots require to be kept without water till August, about which time the roots will put forth fresh leaves. The Cape species scarcely ever produce seeds in Europe, nor do they indeed all readily flower, without a great degree of heat, though most of them succeed by being placed in a glass frame, after they have put forth leaves in pots in the open air. The species are arranged by their leaves, which in most are ternate. *O. sensitiva* alone, the East Indian one, has pinnate foliage.

Three have simple, four twin, and six digitate leaves. A few examples will illustrate each of the sections, which are nine in all.

SECT. 1. *With simple Leaves.*

O. monophylla. Simple-leaved Wood Sorrel. Linn. Mant. 241. Thunb. Oxal. 8. t. 1. f. 1. Jacq. Oxal. 56. t. 79. f. 3. Willd. n. 1. Ait. n. 1.—Stem none. Stalks single-flowered. Leaves elliptical, obtuse. Filaments smooth.—Native of sandy hills at the Cape. Sent by Mr. Masson to Kew in 1774, where it is said to have flowered in October and November. The *bulb* is ovate, about as big as a hazelnut, with a very fibrous coat. *Leaves* four or five, scarcely an inch long, entire, finely downy at the edges only, on stalks about the same length. *Flower-stalks* taller than the leaves, round, downy. *Calyx* downy. *Corolla* pale purple, an inch long, with yellow claws. *Stamens* much shorter than the corolla, all smooth; five of them very short, the rest rising much above the *styles*, which are clothed at the top only with glandular hairs. *Stigmas* obtuse, downy.

O. lepida. Jacq. t. 21, and *rostrata*, t. 22, seem to us too nearly related to the above. There is in fact not the least difference between any of them, except in the *stamens* and *styles*. In *lepida* five of the *stamens* are extremely short, and the rest but half the length of the *styles*, which in this species are remarkably long, straight, and perfect, covered, like the longer stamens, with glandular hairs; their *stigmas* large and bearded. In *rostrata* the *styles* are extremely short, smooth, and turned out horizontally between the *stamens*; the five shortest of which rise far above them, and the five longest, which are hairy, more than twice as far, ending in a very peculiar glandular tip above each *anther*. This appendage is analogous to what is seen in the New Holland genus *Boronia*, and has been cited, by the writer of the present article, as one indication, amongst others, of the affinity between these two genera, which their mutual acidity countenances. In the present case he hazards another conjecture, that the two species of *Oxalis* in question may be sexual varieties; in one of which, effectually male, *rostrata*, the *stamens* are most perfect; in the other, *lepida*, the *pistils*. Experience only can settle this curious question, which appears not to have entered into the mind of their cultivator and describer, Jacquin. *O. monophylla* seems to be the natural or ordinary state of the same plant, in which the *stamens* and *styles* bear that due proportion to each other, observable in other species.

SECT. 2. *With twin Leaves.*

O. aspinina. Asses-eared Wood Sorrel. Jacq. t. 24. Willd. n. 4. Ait. n. 3.—Stem none. Stalks single-flowered. Leaflets elliptic-lanceolate. Five of the stamens glandular, and taller than the styles.—From the Cape. The *leaves* are numerous, each pair on a winged obovate foot-stalk; *leaflets* glaucous, two inches or more in length, with white, crenate, cartilaginous edges. *Flowers* yellow, on stalks rather taller than the foliage. Five of the *stamens* very short and smooth; the rest glandular, with a smooth projection at their base, and rising to nearly twice the height of the *styles*, which seems to be their most proper and usual proportion in this genus.

We cannot but make the same remark as in the former section, respecting *lanceifolia*, (an ill-constructed name), Jacq. t. 26; which though subject to have some ternate leaves, scarcely differs otherwise from the *aspinina*, except in having the *stamens* all smooth, without a projection at the base, and nearly of equal length, seemingly feeble and imperfect, while the vigorous *styles* rise much above them, and,

and, if we mistake not, indicate this to be the female plant, the former the male.

O. crispata, t. 23, and *leporina*, t. 25, two whitish-flowered species of this section, in both which the *styles* surmount all the *stamens*, may probably be distinct, as differing considerably in their *leaves*, though otherwise nearly related to each other.

SECT. 3. *With ternate Leaves, and a single-flowered Stalk.*
Here Willdenow has thirty-two Species.

O. fabaeifolia. Bean-leaved Wood Sorrel. Jacq. t. 27. Willd. n. 8. Ait. n. 7.—Stem none. Stalk single-flowered. Leaflets obovate, emarginate, on winged footstalks.—Nearly allied to *aspinata*, though unquestionably a very distinct species. The *leaflets* are ternate, broad, obovate and emarginate, quite entire, without any cartilaginous edge. Wings of the *footstalks* also very broad. *Flowers* yellow, very pale at the back. *Stamens* all glandular and rather short, with five prominent teeth at the base. *Styles* of an intermediate length between the longer and shorter *stamens*.

O. sanguinea. Bloody-leaved Wood Sorrel. Jacq. t. 29. Willd. n. 10. Ait. n. 9.—Stem none. Stalks single-flowered. Leaflets oblong, obtuse, downy; the lateral ones dilated, the middle one contracted, at the base. *Styles* and longer *stamens* hairy.—With this we would unite *laburnifolia*, Jacq. t. 28, as differing chiefly in having the *styles* longer than any of the *stamens*, whereas in t. 29 they are intermediate between the longer and shorter. The herbage of both is downy. *Footstalks* and backs of the *leaves* deep red. *Petals* yellow, externally downy. There are a few glandular hairs, besides the simple ones, on the *calyx* of *laburnifolia*, and the teeth of its longer *stamens* are rather shorter and thicker than in the other, which, all things considered, only shews those characters to be variable.

O. acetosella. Common Wood Sorrel. Linn. Sp. Pl. 620. Sm. Fl. Brit. n. 1. Engl. Bot. t. 762. Curt. Lond. fasc. 2. t. 31. Woodv. Med. Bot. t. 20. Fl. Dan. t. 980. Willd. n. 25. Ait. n. 18. Jacq. t. 80. f. 1. (*Oxys alba*; Ger. em. 1201.)—Stem none. Stalks single-flowered. Leaflets inversely heart-shaped, hairy. *Styles* and *stamens* smooth. Root of scaly joints.—Native of shady groves in most parts of Europe; frequent with us in the spring. The root is remarkable for being jointed, or composed of small clusters of fleshy scales, connected by a thread-like stalk. *Leaves* on long, weak, hairy, wavy stalks; their *leaflets* drooping, folded, purple at the back. *Flower-stalks* taller than the leaves, each bearing a delicate drooping inodorous flower, whose white or bluish-coloured *petals* are veined with purple. The longer *stamens* are equal to the *styles*, and all are smooth. The *capsules* dart forth their seeds at the slightest touch, by means of their elastic *arillus*, or tunic. Some old authors have named this plant *Lujula*, which the Italians are said to have metamorphosed into *Alleluia*; and then, to account for this novel appellation, they supposed it arose from the flowers appearing at the season when *Alleluia* was sung in their churches! The *leaves* possess an agreeable acidity, mixed with astringency, and their conserve, made with fine sugar, has the flavour of green tea. Its qualities are cooling and refreshing, but the abundance of common fruits which have the same properties, has superseded the medicinal use of this very grateful preparation.

O. marginata. Bordered Wood Sorrel. Jacq. t. 68. Willd. n. 27.—Stem none. Flower-stalk single-flowered, but half the length of the footstalks. Leaflets squarish, emarginate. Calyx fringed. Stamens without teeth.—The root is bulbous, with a smooth coat. *Leaves* dark green,

downy, broad and short, on red stalks, forming a dense tuft. *Flowers* white with streaked claws, large, on short declining stalks. The *styles* in this are of intermediate length between the *stamens*. In *pulchella*, Jacq. t. 69. Willd. n. 28. Ait. n. 19, they rise much above all the *stamens*. This latter therefore we cannot but consider as a mere female variety, there being nothing that indicates a specific difference, but rather a peculiar conformity, in the rest of the plant.

SECT. 4. *With ternate Leaves, and a many-flowered Stalk.*
Nine Species in Willdenow.

O. megalorrhiza. Great-rooted Wood Sorrel. Jacq. Oxal. 33. Willd. n. 42. (*Oxys luteo flore*, radice crassissima; Feuill. Peruv. v. 2. 734. t. 25.)—Stem none. Stalk umbellate. Leaflets inversely heart-shaped. Root very thick, much branched at the summit.—Native of the mountains of Peru. It is known only from the figure and description in Feuillée, but the very large, branched, fleshy root, running deep into the earth, and dividing into many thick heads at the summit, is altogether peculiar in this genus. The *stalks* of the *leaves* and those of the *flowers* are each about three inches high. The *petals* are yellow, with red veins.

O. tetraphylla. Four-leaved Wood Sorrel. Cavan. Ic. v. 3. 19. t. 237. Willd. n. 43, seems a most trifling variety of the following, which happens to have sometimes four leaflets on a stalk. Cavanilles saw it in the garden at Madrid, to which it was sent from Mexico.

O. violacea. Violet American Wood Sorrel. Linn. Sp. Pl. 621. Jacq. Hort. Vind. v. 2. 84. t. 180. Oxal. t. 80. f. 2. Willd. n. 44. Ait. n. 24.—Stem none. Stalk umbellate, many-flowered. Flowers drooping. Leaves inversely heart-shaped, fringed.—Native of Virginia and Canada. Mr. Aiton, like Jacquin, marks it as a greenhouse plant, flowering in May and June. The roots are bulbous, aggregate, with interspersed scales. *Leaves* numerous, fringed, broadly obcordate, on stalks about a span high. *Flower-stalks* rather taller, umbellate, sometimes, but not constantly, forked, with a solitary intermediate flower. The *blossoms* are at first drooping, then erect, with delicate, recurved, striated, light purple *petals*. Tips of the *calyx-leaves* sometimes abrupt and glandular.

SECT. 5. *With ternate Leaves, single-flowered Stalks, and a Stem naked below.* Fifteen Species.

O. ciliaris. Fringe-leaved Wood Sorrel. Jacq. t. 30. Willd. n. 49. Ait. n. 29.—Stem erect, simple. Leaves clustered at its top. Leaflets elliptic-oblong, emarginate, hairy. Bractees linear, close to the flower.—From the Cape. Sent by Mr. Masson in 1793. The root is a smooth bulb. Stem three or four inches high, almost leafless, except at the top, where is a cluster of numerous, glaucous, downy, ternate leaves, of a nearly elliptical form, with a notch at the end. *Flowers* red, on simple stalks taller than the leaves, with a pair of oblong linear bractees close to the calyx. The *styles* rise above all the *stamens*, and like them are hairy.

O. arcuata. Glandular Wood Sorrel. Jacq. t. 31. Willd. n. 50. Ait. n. 30.—Stem decumbent, simple, naked below.—Leaves clustered at its top. Leaflets linear, emarginate, hairy. Bractees linear, close to the flower.—Nearly allied to the last, but probably a distinct species. We cannot but consider it however as the male plant of *O. linearis*, Jacq. t. 32, for the same reasons that have led to our preceding opinions. The *styles* are very short in *arcuata*, very long in *linearis*.

O. natans. Floating Wood Sorrel. Linn. Suppl. 243. Willd.

Willd. n. 58. Ait. n. 35. Thunb. Oxal. 9. t. 1. f. 4. Jacq. t. 76. f. 2.—Stem floating, naked below. Leaves clustered at its top. Leaflets inversely heart-shaped, smooth. Calyx smooth.—Native of pools and ditches at the Cape; the slender stem varying in length according to the depth of the water, the tufts of leaves floating on the surface. Flowers erect, white, yellowish at the base, on simple stalks, scarcely so long as the leaves. The footstalks in our specimens are hairy, especially their summits close to the leaflets.

O. versicolor. Striped-flowered Wood Sorrel. Linn. Sp. Pl. 622. Willd. n. 6. Ait. n. 37. Sm. Ic. Pic. t. 7. Curt. Mag. t. 155. Jacq. t. 36. and t. 77. f. 4.—Stem weak, naked below. Leaves clustered about its top. Leaflets linear, emarginate, with two callous points beneath.—An elegant species, conspicuous for the crimson margins of the white petals, which give the buds a spirally striped appearance.

SECT. 6. *With ternate Leaves, single-flowered Stalks, and a leafy Stem.* Twelve Species.

O. tubiflora. Tube-flowered Wood Sorrel. Jacq. t. 10. Willd. n. 67. Ait. n. 44.—Stem erect, somewhat branched, leafy, hairy. Leaves nearly sessile, alternate. Leaflets linear-wedge-shaped, recurved. Tube of the flower much longer than its border.—The stem is about a foot high, round, hairy, beset with numerous, scattered, small, nearly sessile, hairy, narrow, ternate leaves. Flower-stalks axillary, solitary, many times longer than the leaves. Flowers crimson; their claws united into a cylindrical downy tube, considerably above an inch long, and nearly twice the length of the limb. Willdenow unites with this Jacquin's *canescens*, t. 11, whose flower is of rather a more blueish purple. In both the styles are shorter than any of the stamens, and we venture to esteem them male plants, *macrostylis* of the same author, t. 9, in which the styles rise above all the stamens, being the female. These two plants are so exactly the same, that nothing but a determination to assume an arbitrary character, and to carry it through in spite of nature, could induce any person to separate them. *O. secunda*, t. 12, is probably another variety.

Dr. Sims in Curt. Mag. under *O. rubella*, t. 1031. Jacq. t. 16. Willd. n. 70. Ait. n. 47, has remarked that *hirta*, t. 13, and *rosacea*, t. 17, of Jacquin, are very nearly allied to that species. We cannot but agree to this, and if we were writing a complete history of the genus, we might perhaps reduce some other supposed species to the same. *O. hirta*, by its long styles, seems a female variety.

SECT. 7. *With ternate Leaves, many-flowered Stalks, and a Stem.* Sixteen Species.

O. stricta. Yellow Upright Wood Sorrel. Linn. Sp. Pl. 624. Willd. n. 80. Ait. n. 52. Jacq. t. 4.—(*O. corniculata*; Fl. Dan. t. 873. *O. ambigua*; Salis. Tr. of Linn. Soc. v. 2. 242. t. 23. f. 4.)—Root creeping. Stem erect, branched. Leaflets inversely heart-shaped. Umbels stalked, axillary, solitary, many-flowered.—Native of North America, now naturalized as a weed in many English gardens. Roots widely creeping, perennial. Stems a foot high, or more, quite erect, slightly branched, leafy, round, reddish, succulent, smooth or downy. Leaves numerous, scattered, on long stalks. Umbels solitary, on long, axillary, solitary stalks, about equal to the footstalks, but straighter. Flowers numerous, small, yellow. Styles about as long as the longer stamens, hairy.—The name of *stricta* well distinguishes this from the following, for which some have mistaken it.

O. corniculata. Yellow Procumbent Wood Sorrel. Linn.

Sp. Pl. 623. Willd. n. 81. Ait. n. 53. Jacq. t. 5. Engl. Bot. t. 1726. (*O. pusilla*; Salis. Tr. of Linn. Soc. v. 2. 243. t. 23. f. 5. *O. lutea*; Ger. em. 1202.)—Stem branched, creeping, diffuse. Leaflets inversely heart-shaped. Umbels stalked, axillary, solitary, of few flowers.—Native of various parts of Europe. Found abundantly naturalized, if not wild state, in Devonshire and other southern parts of England, flowering from May to October. The long, trailing, creeping stems, and the fewer flowers in each umbel, distinguish it from the last. The name of *corniculata* has remained with this, because old authors called it *Trifolium corniculatum*, alluding to the long seed-vessels. Both these last are acid, and might supply the place of *O. acetosella*, if wanted for medical use.

O. barrelieri. Twin-clustered Wood Sorrel. Linn. Sp. Pl. 624. Willd. n. 86. Jacq. t. 3. (*Trifolium acetosum americanum*, rubro flore; Barrel. Ic. t. 1139.)—Stem erect, branched, leafy. Leaflets ovate, acute, stalked. Clusters in pairs, on a solitary axillary stalk.—Native of the hotter parts of South America. We have it not in our gardens. Jacquin has it in his stove, and complains of the difficulty of saving seeds, as the capsules are so elastic. The root is fibrous and annual. Stem twelve or eighteen inches high, hairy, branched, leafy. Leaves on long stalks; leaflets ovate, acute, entire; the terminal one on a longer stalk than the lateral ones. Flowers small, numerous, pale red, in a pair of divaricated, stalked, axillary clusters. Capsule short, ovate.

SECT. 8. *Leaves fingered.* Six Species.

O. lupinifolia. Lupine-leaved Wood Sorrel. Jacq. t. 72. Willd. n. 89. Ait. n. 55.—Stem none. Leaflets numerous, elliptic-lanceolate, glaucous, smooth. Stalks solitary, single-flowered.—Native of the Cape.—The leaves spread like a fan; each leaflet has a black line at the base. Flowers large, of a golden yellow. This is a very handsome species, as well as Jacquin's *flava*, t. 73, which has narrow linear leaflets; *flabellifolia*, t. 74, and *pectinata*, t. 75, both which last have broader oblong leaflets, and seem to us one species, differing merely in the comparative proportions of their stamens and styles, like others already mentioned.

If we thus presume to curtail the species, we do it with much respect for the able authors who have so greatly augmented the number, and we merely wish to suggest our scruples, which are altogether theoretical, for the consideration of practical observers and cultivators.

SECT. 9. *Leaves pinnate.*

This section is at present known to contain only

O. sensitiva. Sensitive Pinnate Wood Sorrel. Linn. Sp. Pl. 622. Willd. n. 93. Jacq. t. 78. f. 4. (*Herba sensitiens*; Rumph. Amb. 301. t. 104. f. 2.)—Leaves pinnate.—Native of the East Indies; unknown in our gardens. The stem is short and simple, crowned with a tuft of very numerous leaves, composed of many pair of obtuse leaflets. Flowers yellow, in numerous stalked umbels. S.

OXALIS, in Gardening, contains plants of the hardy, herbaceous, perennial kind, of which the species cultivated are; the common wood sorrel (*O. acetosella*); the upright wood sorrel (*O. stricta*); the goat's-foot wood sorrel (*O. caprina*); the striped-flowered wood sorrel (*O. versicolor*); the purple wood sorrel (*O. purpurea*); and the flesh-coloured wood sorrel, (*O. incarnata*.)

But there are many other species that may be cultivated. *Method of Culture.*—The first sort may be readily increased, by planting the divided roots in a moist shady border

der in the early spring season, which afterwards require only to be kept clear from weeds.

And the other sorts may be increased, by planting off-sets from the roots or bulbs that come out from the sides of the stems, in pots filled with good light mould, sheltering them in the dry stove or under a frame during the winter, admitting as much free air as possible in mild weather. They only require to be protected in the winter season afterwards, and occasionally removed into other pots.

The two first sorts and varieties may be introduced in the borders, and the others afford variety among other potted plants.

OXALIS, in the *Materia Medica*. The oxalis acetosella is totally inodorous, but has a grateful taste, so that it is useful in fallads by supplying the place of vinegar, and which is more agreeable than the common sorrel, (*rumex acetosa*), and approaches nearly to that of the juice of lemon, or the acid of tartar, with which it also corresponds in a great measure in its medical effects, being esteemed refrigerant, antiscorbutic, and diuretic. It is recommended by Bergius in inflammatory, bilious, and putrid fevers. The principal use, however, of the acetosella is to allay inordinate heat and to quench thirst; for this purpose, a pleasant whey may be formed by boiling the plant in milk, which, under certain circumstances, may be preferable to the conserve directed by the London College, though an extremely grateful and useful medicine. Many have employed the root of Lujula, probably on account of its beautiful red colour rather than for its superior efficacy. An essential salt is prepared from this plant, known by the name of "essential salt of lemons," and commonly used for taking ink-stains out of linen. This salt is made from the expressed juice. Thunberg found that the oxalis cornua of the Cape of Good Hope yields the salt in greater quantity than the acetosella. This salt, when genuine, which is seldom to be procured so, is composed of the vegetable alkali and a peculiar acid, which seems more allied to the acid of sugar than that of tartar. Bergman has given the method of separating this acid (*Act. Up. Nov. vol. ii. p. 215.*), and it is related by Murray, *Ap. Med. vol. iii. p. 497.* What is sold under the name of "essential salt of lemons" in this country, appears sometimes to consist of cream of tartar, with the addition of a small quantity of vitriolic acid. The active principle of the expressed juice, which reddens vegetable blues, coagulates milk, and instantly precipitates lime from its solutions, is superoxalat of potash, which is obtained crystallized from the juice, and sold in the shops under the name of "essential salt of lemons." The same salt may be formed by cautiously dropping a solution of potash into a saturated solution of the oxalic acid, obtained from sugar by the action of the nitric acid; the superoxalat precipitates as soon as the proper quantity of alkali is added. On the continent this salt is prepared by the following process: the juice is allowed to subside after being slightly heated, and then clarified by adding to it water, in which a small portion of fine clay is suspended. This clarified juice is next boiled till a particle forms on its surface, and put aside for a month to crystallize: the operation being repeated until the whole of the salt is obtained, when it is purified by a second crystallization. *Annal. de Chimie. xiv. 7. Woodville. Thomson.*

OXALME, in the *Materia Medica of the Ancients*, the name of a composition of vinegar and brine, made by a solution of sea-salt in water. This was used externally in ulcers, and supposed of great service against the bites of venomous animals, and for the curing children's scabby heads.

It was also used as a styptic poured into wounds, and was sometimes given warm in clysters; but these were always followed by those of milk.

OX-BOOSE, in *Rural Economy*, a stall or place where oxen stand in the winter to be fed or fattened.

OXBOW, GREAT, in *Geography*, a bend of the river Connecticut, about the middle of the township of Newbury, in Vermont; it contains 450 acres of the finest meadow land in New England.

OXELÆUM, a word used by many authors to express a mixture of vinegar and oil, for outward application, in cases of bruises and other injuries.

OXEN. See Ox.

OXEN Creek, in *Geography*, a river of Maryland, which runs into the Potomac, N. lat. $38^{\circ} 55'$. W. long. $37^{\circ} 8'$.

OXENBACH, a town of Austria; 9 miles S. of Ips.

OXENSTIERNA, AXEL, Count, in *Biography*, a celebrated Swedish minister, was born at Fano, in Upland, in 1583. He received his education at Rostock, Wittenberg, and Jena, made great progress in the languages, and in various branches of science, but he seemed particularly attached to theology. When he had finished his academical studies, he paid a visit to most of the German courts; on his return he was received into the service of Charles IX., who, in 1606, sent him as envoy to the court of Mecklenburg. In 1609 he was admitted a member of the senate. The first public business assigned to him, was the adjustment of some differences that subsisted between the Livonian nobility and the city of Revel, which he brought to a happy conclusion. He had now given such a favourable display of his talents, that the king, who was far advanced in life, made choice of him to be guardian to the royal family, and placed him at the head of the regency. On the accession of Gustavus Adolphus, he was promoted to be chancellor, and in 1613, when overtures were made for peace between Sweden and Denmark, he was appointed chief negotiator on the part of the former. In the following year he accompanied the king in his expedition into Germany, and he had the satisfaction of seeing an end put to hostilities between Russia and Sweden, by an honourable peace. He continued to advance in the confidence and esteem of his sovereign, till at length he was invested with full authority in all civil and military affairs on the Rhine, and the king having advanced into Bavaria and Franconia, Oxenstierna fixed his head-quarters at Mentz, whence he proceeded with the troops that he had collected to join his majesty, and then took up his station with some regiments in the upper part of Germany, while Gustavus advanced to Lutzen, where he fell in the arms of victory in the year 1632. Oxenstierna was much afflicted, but not dispirited, by this melancholy event. He collected more troops for the defence of Sweden and the allies; and undertook a journey to Dresden and Berlin, to concert measures with the electors of Brandenburg and Saxony, in regard to the prosecution of the war. An unlimited commission was now given him by the Swedish government, to pursue such plans as he might think most conducive to the benefit of his country. He became director of the allied powers, distinguished by the name of the Evangelic League. This elevation gave rise to much discontent, and other circumstances united with it threw things into confusion. Oxenstierna, however, by his prudent and judicious conduct, found means to revive the drooping spirits of his party, and to surmount every difficulty with which he was embarrassed. He was recalled to Sweden in 1636, after an absence of about ten years, resigned the authority with which he had been invested, and took his seat in the senate as chancellor of the kingdom, and as one of the five guardians

dians of the queen. His chief care was now to instruct the queen in every thing that related to the art of government, and he had in a short time the happiness of being the means of concluding a peace by the famous treaty of Westphalia. He assisted at Bromsebo at the negotiation with Denmark in 1645, and on his return queen Christina conferred on him the title of count. At the same time he was chosen chancellor of the academy of Upsal, an office which he filled with zeal, assiduity, and success. He opposed most earnestly the intended abdication of the queen, and when he found his admonitions fruitless, he feigned indisposition to avoid the mortification of being present at the debates on a measure which he conceived to be fraught with so much evil. He died in the month of August 1654, leaving behind him a great reputation for talents and disinterested virtues. "His character," says one of his biographers, "may be put in competition with that of the most celebrated men who have acted a distinguished part on the grand theatre of the world; and his name will, at all times, be classed among those who have done immortal honour to mankind. The natural powers of his mind were strengthened by an excellent education, and by the study of the most useful sciences. No person was better acquainted with the art of prying into the recesses of the human heart; and the knowledge which he thus obtained he endeavoured to employ to the best advantage. His political sagacity excited no less respect than admiration; and he lived at a period which gave him an opportunity of displaying, to its full extent, the strength and solidity of his judgment. His eloquence was concise but nervous. He possessed the happy talent of foreseeing the various results with which any measure might be attended, and of thence deducing the best rules for directing him in his public conduct. His integrity not only procured him friends, but enabled him to outstrip all his competitors, and to overawe those who were hostile to his designs. The storms and vexations to which he was often exposed, he withstood with firmness, prudence, and magnanimity. The independence of his country was the darling object of his heart, and he possessed talents sufficient to defend it against every attack. His name was celebrated all over Germany, and cardinal Richelieu was compelled to admit that his mind was an inexhaustible source of wise counsels and prudent expedients." He was author of several works, of which a list is to be found in Stiernman's "Bibliotheca Suio-Gothica." The second part of the "Historia Belli Sueco-Germanici," usually ascribed to P. B. Chemnitius, was composed by Oxenstierna. Gen. Biog.

OXENSTIERNA, JOHN, son of the preceding, was born at Stockholm in 1611. He was educated in a manner suitable to the rank of his family, and in 1631 he set out to improve himself still farther by travelling in foreign countries. On his return he embraced a military life, and distinguished himself so much by his zeal and activity in that department, that he was soon appointed colonel of a regiment in Germany. Being called by his father to Frankfort on the Mayne, to assist him in conducting the affairs of the evangelic league, he repaired to that city, and in 1634 was dispatched thence to England on business of great importance. He was afterwards one of the commissioners for settling the affairs relating to Poland, and in 1641 was invested with full power as plenipotentiary to assist at the negotiations for peace in Germany. Peace being concluded at Osnaburg, Oxenstierna was ordered by the queen to repair to Pomerania, to adjust some affairs with the elector of Brandenburg; and on his return to Sweden he was appointed by Charles Gustavus, who had then ascended the throne, to be marshal of the kingdom. In 1654 he was sent again to Germany on public business, and died at Weimar, in December 1657. He was a man

of great eloquence and extensive knowledge. Whatever he undertook he exerted his utmost ability to accomplish; and being guided in all his actions by a strong sense of rectitude, his conduct, on every occasion, acquired for him esteem and respect. Gen. Biog.

OXENSTIERNA, ERIC, brother of the preceding, chancellor of Sweden, member of the senate, &c., was born at Fiholm, the seat of his family, in 1624. He studied at Upsal, and in 1643 set out on a tour to Germany, with a view to improvement. On his return, queen Christina appointed him first gentleman of the bed-chamber; but this office he resigned in 1646, and was appointed governor of Esthonia. He obtained other high offices in the state, and was at length nominated vice-chancellor, in order that he might assist his father, now almost borne down by the weight of years and infirmity. After the diet of 1655, at which he proved by his talents that he was worthy of the confidence which placed him in that situation, he followed the king his master to Poland; and that country, as well as Prussia, having been reduced to the necessity of yielding to the Swedish arms, Oxenstierna was made choice of to conduct the negotiations then entered into with the elector of Brandenburg, which he brought to a happy termination. As a reward for this service, he was raised by the king to be governor-general of Prussia, and this important office he retained till the period of his death, which took place at Elbing in 1656, when he was in the thirty-third year of his age.

OXEY, in *Rural Economy*, a provincial word, signifying like the ox, or of mature age, not steerish.

OX-FEET, a term applied to the feet of horses, when the horn of the hind feet cleaves just in the middle of the fore-part of the hoof, from the coronet to the shoe: they are not common, but very troublesome, and often make a horse halt.

OXFORD, in *Geography*, a city and university of Great Britain, is seated nearly in the centre of England, on the southern border of Oxfordshire, to which it imparts a name, and is the chief or principal town of that county. This city occupies a site which plainly indicates a monastic origin; and indeed still retains many external features and internal customs expressive of its primary establishment. It formerly contained nineteen monastic houses. In natural position it has neither a military nor commercial aspect; but is seated in a flat, sedgy country, on a tract of land bounded eastward by the river Charwell, or Cherwell, and on the west by that of the Isis. These rivers ramify into numerous streams at this place, and unite their accumulated waters on the south side of the city. Both the rivers, as well as the city, have acquired classical celebrity by the harmonious strains of different poets: Cowley, Pope, Prior, Phillips, Warton, and other modern authors, have attuned their respective lyres in praise of this "Modern Athens," as Camden styles it. Wood, in "Athenæ Oxonienses," mingling a little hyperbole with truth, pronounces Oxford "the most noble theatre, and emporium of all good sciences, the very source and most clear spring of good literature and wisdom; from which religion, civility, and learning have spread most plentifully through all parts of England, and beyond the seas." Many topographers and antiquaries have also evinced much labour and research in developing the historic annals of the university; but though several volumes have been appropriated to the subject, there is ample scope for a new work, to include all the essential information of former writers, with judicious criticism, antiquarian elucidation, and accurate illustration.

The appearance of Oxford from the high grounds to the east and south-west is singularly picturesque and interesting;

it comprehends groups of towers, domes, spires, pinnacles, and turrets, intermixed with solemn masses of foliage; and surrounded by verdant meadows, intersected by several streams. Occasionally the latter present an ocean-like appearance; when the swollen waters overflow their natural bounds, and inundate the flat lands. At such a time Oxford seems like an island; but it is an island filled with monastic palaces, intermixed with groves and gardens. In spring and autumn this effect is not unfrequent. The approaches to the city, from the east, the London road, from the north, the west, and the south, are all very imposing and beautiful; and each presents a very dissimilar appearance and effect to either of the others. From the east, Magdalen bridge, with the towers and groves of that college, and the rich botanic gardens, are seen near the fore-ground, over and beyond which the eye catches partial views of the towers and spires of St. Mary's, All-Saints, Christ-church, and other lofty buildings. On passing the bridge, and proceeding up the High-street, certainly one of the finest in Europe, the fronts of several colleges, churches, and private dwellings, are gradually and successively unfolded to the sight. This street is broad and long; it has a gentle bend or curve in its whole extent, and this constitutes one of its fine features. At almost every step the passenger is presented with new objects, and fine combinations; and at one point the whole coup d'œil is singularly impressive and picturesque. This is at a broad part of the street, near the middle, where Queen's college, on the right hand, and University college, on the left, form the fore-ground of the scene, whilst the front of All-Souls, the steeple and rich windows of St. Mary's church, the modern spire of All-Saints church, and the old tower of St. Martin's, constitute the prominent features in the distance; and all together present a street scene of unrivalled beauty, variety, and effect. This scene, heightened by the glow and brilliancy of the setting sun, is rendered still more impressive. (See a very fine print of it, 24 inches by 16, engraved by J. Pye, from a painting by J. M. W. Turner, R.A.) The other entrances to Oxford, though not so interesting as this, are all grand, and highly prepossessing; and each is calculated to stimulate the curiosity of the stranger, and excite emotions of anxiety and pleasure. A broad street, skirted with rows of old trees, and flanked by the observatory, St. Giles's church, St. John's college, and many private houses, is the approach from the north; whilst the opposite entrance is from meadows over three or four bridges, where the noble towers and turrets of Christ-church, with its vast grove of stately elms, constitute the chief feature. On the west the road is extremely unlike either of the former; and though not so grand and so architectural as those, is singular and curious. An artificial causeway, or raised road, with several bridges over different branches of the Isis, has been formed through the level meadows, for a full mile in length, and in nearly a straight line. At the eastern termination of this, and at the western extremity of the city, is a lofty conical mound, formerly the keep of the castle, with an ancient castle tower and some modern towers, which now constitute the county gaol.

The whole buildings of this city occupy an area of ground extending about one mile from north to south, and the same length from east to west. It is intersected in the same direction by two principal thoroughfares, or streets, with several smaller streets and lanes. On the south, east, and west, it is skirted by meadows, and on the north by corn fields. The latter side was formerly guarded by three different lines of fortification: a bold fosse and ditch, at some distance from the buildings, extended from the river on the east to the river on the west, and a lofty wall with bastion towers,

inclosed the chief buildings of the city on the same side. The city of Oxford, with its immediate suburbs and liberties, comprises fourteen parishes.

In the following history and description of this renowned ancient university, but modern city, we propose to be more circumstantial than in the generality of our topographical articles; because, on examining other Cyclopædias, Gazettes, and general geographical works, we find it has been very imperfectly and inaccurately treated. In the sequel we shall particularise our authorities.

Historical Events.—As may be readily conjectured, the origin and ancient history of the town and university have been subjects of anxious investigation among the learned in different ages; and much curious, but fanciful speculation, has been exhibited by those who were ambitious to bestow on it a claim to very remote antiquity. John Ross, or Rous, whom Dugdale terms a "famous antiquary," even asserts, that a town was built here by Memphric, king of the Britons, upwards of a thousand years before the Christian era. This town, the same author observes, was first called *Caer-Memphric*, in honour of its founder; then *Bellestium*, from a pretty mountain near it; afterwards *Ridohen*, implying, in the Celtic language, a ford of oxen; and *Caer-Vosse*, from *Bosso*; the name of an earl who was contemporary with king Arthur.

Such a view of the origin of Oxford, however, though accredited and repeated by several of the most distinguished antiquaries of modern times, is justly considered by Camden and others to be fabulous, as the historian above quoted does not pretend to have derived his information on this subject, from any more authentic source than the legendary tales of the British bards. What strongly corroborates their opinion is, the fact, that no mention of Oxford occurs during the Roman era; for the idea of Wood and Leland, that it was the *Calleva* of that celebrated people, and a place of splendour and notoriety under their government, has been proved to be altogether erroneous. The same doubts cloud the history of Oxford during the early part of the Saxon dynasty, as at any former period. Indeed, no credit can be given, by the rational enquirer, to any statement respecting it till the reign of Alfred, when it appears to have been famous for a monastery dedicated to the Holy Trinity. This was founded in 727, and was most probably the nucleus whence the town actually derived its origin, by collecting around it the habitations of the laity. At all events, whether this was the source of its existence or not, it is certain that a town of some kind occupied the site of Oxford in the tenth century. In 979 it was mostly burnt, and in 1002 again suffered the same fate. It soon revived, however, but only to encounter fresh disasters. In 1009, Swein, king of Denmark, set fire to it; and when, in revenge, king Ethelred ordered a general massacre of the Danes throughout all his dominions, the command was executed with terrible fidelity at Oxford. No regard was paid either to sex or age; even the altars were polluted with the blood of the devoted victims. Among those who perished on this occasion, was the lady Gunilda, sister to the Danish monarch.

This savage policy of the Saxon king inflamed the resentment of Swein to the highest pitch; he consequently made a descent upon England with an overwhelming force, and laid in ashes many of the principal towns; but it appears that he only frightened the inhabitants of Oxford into a surrender, and imposed upon them a heavy contribution. About three years after this event, Ethelred having returned from France, whither he had fled to avoid the vengeance of Swein, invited some of the Danish nobles hither to a conference, and treacherously caused two of their
number

number to be put to death. The remainder, fearing the same fate, immediately took to arms, but were overpowered; and either fell by the sword, or were consumed in the conflagration of St. Frid's church, in which some of them had sought protection from the rage of their assailants. During the subsequent contests of the Danes and Saxons, Oxford frequently suffered severely. It attained, however, at this period, a very high degree of political importance. King Edmund, surnamed Ironside, occasionally resided here; and was unhappily murdered in the town, November 30th, 1016. Canute the Great held his court frequently at Oxford; and in 1022 he assembled here a general council, in which the laws of Edward were discussed, and made binding upon all his subjects, Danes as well as English. The same monarch, in a subsequent parliament, confirmed the edicts of king Edgar. Harold, surnamed Harefoot, likewise fixed his chief residence at this place, which was the scene both of his coronation and of his death. When William the Conqueror made a progress to the north, after he had been crowned at Westminster, the inhabitants of Oxford being much attached to their deceased sovereign, refused to open their gates to the usurper of his throne. The king was therefore compelled to obtain entrance by force of arms; and as a punishment for their resistance, he levied upon the townsmen a tax much higher than was paid by other towns. The better, however, to restrain their rebellious spirit, he conferred the government of Oxford on Robert de Oigli, a Norman of tried valour, and empowered him to build and fortify a castle. This structure was of great size and strength, and was raised on the west side of the town, near the river.

After the completion of the castle, Oxford became more submissive, and long before the termination of the Conqueror's reign appears to have been perfectly reconciled to the Norman government. The immediate successors of William frequently made it the place of their residence, and on several occasions summoned parliaments and councils to it. When king William Rufus found his throne threatened by formidable insurrections in the north, he convened a general council here, and declaring his resolution to govern his subjects with strict impartiality, succeeded in confirming the allegiance of many of his great barons, who might otherwise have deserted his interest; and through their means was enabled to quell the revolt. King Stephen several times held his court here; and during the contest for the crown between him and the empress Maud, the latter having taken up her abode in the castle, was besieged in it by the king in person, and only effected her escape, by stratagem, the day previous to its surrender. In 1154 a council met at Oxford, and it was formally agreed that Stephen should retain the crown till his death, when it was to devolve on prince Henry, son to the empress.

Henry II. convened several councils at Oxford; and in the year 1177, the princes and chief lords of Wales did homage to him here for their territories and estates. This monarch resided, during a great part of his reign, in the palace of Beaumont, which had been erected in the north suburbs by Henry I. Within the walls of that structure, his heroic son, Richard Cour-de-Lion, was born, and subsequently held one council here anterior to his departure for the Holy Land. King John passed many of his troubled hours in the same palace; and had a meeting with his indignant barons in the vicinity about two months before he was compelled to sign that grand bulwark of English liberty, Magna Charta. Henry III. following the example of his predecessors, occasionally fixed his abode at Oxford, and held many parliaments and councils here on subjects of great political importance.

In the reign of Henry VIII. Oxford was constituted the seat of a bishop's see, and consequently elevated to the rank of a city. By order of queen Mary, archbishop Cranmer, with bishops Ridley and Latimer, were executed here, October 1555, for heresy to the Romish church. Her successor, queen Elizabeth, frequently visited Oxford, as will be more particularly mentioned in the sequel of this article. In the year 1577 the plague raged with dreadful mortality in this town. While the court sat on the trial of a popish bookseller, accused of circulating offensive pamphlets, a sudden sickness seized nearly the whole of the persons present; and within forty hours upwards of 300 persons died, among whom were the lord chief baron, the high sheriff, several justices of the peace, and most of the jurors. The effect of the earthquake in 1580 was severely felt at Oxford. The inhabitants quitted their houses in great terror; but no very serious damage was done notwithstanding the violence of the emotion. King James I. withdrew to this city when the plague broke out in London. The malady, however, likewise found its way hither, and began its devastations with such awful effects, that the scholars fled from the university, and the citizens shut their shops. "Not a living creature," says Ayliffe, "besides nurses and corpse-bearers, was to be seen in the streets, which were covered with graves, even in the market-place."

Charles I. held a parliament at Oxford in the early part of his reign; and at a subsequent period, when he found it expedient to quit London, he chose this city for his place of abode, being well assured of the loyalty of the citizens, and of the collegians. The whole melancholy winter of 1646 was spent by that monarch within the walls of Christ-church, where he assembled the shattered remains of his parliament, and whence he wrote the memorable letter to lord Digby, declaring, that "if he could not live as a king, he would die as a gentleman." The negotiations for peace between Charles and the republican parliament were chiefly carried on at Oxford; but no military event of any consequence occurred here throughout the war, though the city was strongly fortified, and its possession considered an object of great importance to both parties. It was surrendered by the express command of the king himself, after he had been made prisoner by the Scots.

The last parliament which met at Oxford was convened in the year 1681, by king Charles II. As party spirit then prevailed in a very high degree, its meeting was attended with many hoisterous circumstances. The popular faction affecting to dread some secret machinations among the Papists, their representatives entered Oxford with a large train of servants and partizans as body guards. Numerous bands of soldiery were drawn up round the royal quarters; and on the whole, according to Hume, "the assembly rather bore the appearance of a tumultuous Polish diet than of a regular English parliament." This parliament lasted only seven days, having been dissolved by the king to prevent a bill of banishment and exclusion from the throne being passed against his brother James, duke of York, afterwards James II., in whose reign many scenes of turbulence happened here, in consequence of his illegal interference with the civil rights both of the city and university. Since that time the annals of Oxford afford no very eminent historical particulars.

Origin and History of the University.—The origin of the university is no less involved in doubt and obscurity than the early annals of the town. Indeed few circumstances have occasioned more zealous discussion than the comparative antiquity of this and the sister university of Cambridge. Numerous essays have been written on both sides of the question;

question; in which much learning and curious investigation have been displayed, but scarcely a sentence of satisfactory information can be extracted from the voluminous mass. Some of the more eager disputants for the remote antiquity of Oxford contend that it was a seminary of learning immediately after the destruction of Troy. "The studies of literature," observes Middendorp, "flourished here ever since those excellent philosophers, with the Trojans, coming out of Greece, under the command of Brute, entered and settled in Britain." Other writers, less fantastical, wish to shew that the university was founded by Arviragus, a British king, who lived in the time of Domitian, about seventy years subsequent to the Christian era. A third class, with greater appearance of candour, decline to affix any precise date to its foundation, but uphold the opinion that it took place during the government of the Romans. All these notions, however, we are decidedly inclined to treat as chimerical, and unworthy of the smallest attention. We shall, therefore, pass them over without further remark, and descend to a later period.

Among the many national improvements attributed to the great Alfred, the foundation, or, as some will have it, the restoration, of the university of Oxford, is one of the most eminent. John Rous, the historian already mentioned, affirms, that he established within this city, at his own expence, three teachers of grammar, arts, and divinity, in three different places. One of the fragments of Leland says, "Alfred founded the university of Oxford at the instigation of his brother St. Neot;" and in the edition of Assef, the contemporary of the monarch, which was published by Camden in 1603, there are several passages corroborative of this assertion. The critical inquiries of succeeding writers, however, have clearly proved these passages to be interpolations, and to have formed no part of the genuine work of Assef. Many conclusive arguments have likewise been adduced to shew that Alfred never founded any school establishment, except that of Winchester. Whitaker, in his "Life of St. Neot," is particularly pointed in exposing the absurdities and contradictions by which the forgery is detected. The interpolated paragraphs do not appear in the older MS. published by archbishop Parker in 1574; nor in that in the Cottonian library since burnt, which Wanley dates about a century after Assef. Add to this, the fact that no mention is made of Alfred in the early statutes, or other records of the university, and it is not possible to resist the conviction that Alfred had no concern either in its original foundation, or its revival at any subsequent period.

At what time then, it will perhaps be asked, was the university really founded? To this question our answer is, that its progress to that rank was gradual, and that, in all probability, no regular system of education, or corporate body for the purposes of learning, existed at Oxford till about the twelfth or thirteenth century. It is admitted, however, that there were numerous schools for the acquisition of knowledge established here at a much earlier date, but these were either of a private nature, or attached to some of the religious houses with which the town abounded. The clergy, before the conquest, monopolized the small portion of learning, which, in those early days, was permitted to enliven the otherwise dark and cloudy atmosphere of European ignorance. They were almost the only teachers to whom the people could apply for instruction. Every monastery, therefore, was in fact a school; and whenever there chanced to be a number of them at one place, it might not improperly be called a seat of learning. It could not, however, be regarded in the light of an university, as that term, in its modern signification at least, implies a corporate

establishment, with the privileges of holding property and conferring degrees. In Domesday-book no mention of such a corporation occurs at Oxford.

Under this view of the subject it seems reasonable to conclude, that when the Conqueror mounted the throne, Oxford enjoyed no greater pre-eminence in learning than what naturally resulted from the number of its monastic establishments, and from the circumstance of its having been, during the preceding century, a favourite residence of the English monarchs. This, indeed, was a certain degree of distinction; and would assist in paving the way to the future celebrity of the town. Its schools might for these reasons be more numerous, and better attended than in other towns, and might possibly possess some few trifling privileges, which would be gradually augmented, till the plan of a modern university was completed.

Henry I., having been educated here, seems to have paid great attention to Oxford as a seminary for learning, and is said to have granted to the teachers and the scholars some important privileges in their individual capacity. In the reign of Stephen learning sunk to a very low ebb, and continued in the same degraded state during that of his successor Henry II. Richard I., however, stimulated its revival in every part of his dominions, but especially gave encouragement to Oxford, because of its having been the place of his birth. Many new halls or schools were established under his royal patronage, and with money issued by his command from his own exchequer. To so flourishing a condition, indeed, did he raise Oxford, that the number of scholars at its several halls, in the early part of the succeeding reign, is stated to have been not less than three thousand. But an unfortunate incident, in the year 1209, interrupted this course of prosperity, and even threatened the total destruction of the town, as a seat of knowledge. A student, engaged in some active exercise, accidentally killed a woman belonging to the town, and dreading punishment, was so imprudent as to fly from justice. The mayor and burgesses, upon being apprized of this occurrence, immediately surrounded the hall to which the supposed murderer belonged, and demanded his person. The master and scholars replied that he had fled; but this answer would not appease the clamours of the multitude, who seized three students, entirely unconnected with the transaction, and obtaining an order from king John for their execution, hanged them without trial or proof. The teachers and scholars, justly enraged at this barbarous treatment, unanimously quitted Oxford, and retired, some to Cambridge, some to Reading, and some to Maidstone in Kent. Nay, so far did they carry their revenge that they applied to the pope, and obtained a papal interdict against the town, and against all persons who should settle in it for the purposes of teaching. This measure effectually humbled the inhabitants, who soon after waited upon the pope's legate, and having begged pardon, and expressed the deepest contrition for their conduct, obtained absolution upon conditions very favourable to the scholars. They consequently returned to their ancient habitations, and the king himself bestowed upon them several new immunities, and among others that they should not be obliged to appear at any foreign judicature, "and that they might have cognizance in causes where one party is a scholar, or the servant of a scholar."

In the reign of Henry III., anno 1229, a serious dispute having arisen between the students and citizens of Paris, the king seized the opportunity to advance the interests of Oxford, by inviting the Parisian masters and scholars to settle there. Accordingly no fewer than one thousand of them resorted hither, but these foreigners introduced such a

dangerous levity of manners, that tumults were continually breaking out, and caused great alarm and disquiet in the town. They had sometimes even the audacity to interfere in political matters. When prince Edward marched towards Wales, after his return from France, the burghers having forbid him entrance into the town, on account of the disturbed state of the realm, the scholars demanded to be let out to meet and salute him at his quarters without the walls. But this being denied by the bailiffs, they armed themselves and broke open one of the gates, when a furious scuffle ensued, and terminated in the complete rout of the townsmen. In consequence of this the king, who was on the eve of holding a parliament at Oxford, required the students to retire from the town until the parliamentary sitting was concluded. The chief part of them therefore repaired to Northampton; and here they became implicated in a more serious affair than that which had occasioned their removal. Offended at the king's command, which they regarded as a punishment, they joined the insurgent barons in the defence of that town against the royal forces, and fought with such desperation, that the monarch would have proceeded against them with the utmost rigour after its surrender, had his vengeance not been restrained by prudent motives.

In such circumstances as we have described, it may reasonably be supposed, that though the number of scholars during the reign of Henry III. was very great, yet the real votaries of learning were comparatively few. But still amongst these few some names have attained considerable distinction from their eminence in the fashionable literature of the age, which was deeply corrupted with the subtleties of the Aristotelian philosophy, and the mysteries of theological belief. The reign of Henry, however, will be always memorable in the annals of the university, on account of an important acquisition of private patronage which prevailed towards its conclusion. Previous to that period the teachers and scholars lodged, and studied in mansions, or halls, rented from the townsmen; and this was one great source of the numerous quarrels which were constantly taking place between them. To remedy this evil, as well as to encourage learning, by conferring upon its professors more complete independence than had hitherto been enjoyed, several public spirited individuals purchased, or built, large houses for their reception, and set the example of appropriating funds for the support of those who might not possess the competent means of pursuing their studies to advantage. By such progressive steps a taste for erecting and endowing colleges was introduced, and first modified, and at length supplanted that which had so long prevailed for the foundation of religious houses, the nurseries of superstition and scholastic sophistry.

The reign of Edward I. is marked with no very interesting features in the annals of literature. That prince, continually occupied in war, and in schemes of political aggrandizement, had little leisure to attend to the advancement of learning. Some privileges, however, were conferred on the university in his time; and towards the conclusion of his reign a violent dispute arose between the university, for such the school establishments here had now really become, and the bishop of Lincoln, in whose diocese Oxford was then included. This dispute related to the limits of the bishop's jurisdiction in university matters, and ultimately led to the total emancipation of the learned body from ecclesiastical authority, under the sanction of a papal bull, granted by pope Boniface in the year 1301.

Edward II. granted many additional privileges to the university, and confirmed all the grants of his predecessors.

Notwithstanding this, however, party feuds were incessant, and occasioned much retardation to the progress of learning. The preaching friars claiming the right of conferring degrees, independently of the university, a violent contest arose on this point; and an appeal was made by both sides to the pope, who, rather inclining to favour the friars, granted them an exemption from the chancellor's jurisdiction. But the king, at the intercession of the university, decreed that this deed should be held as void, and ordered that such of the friars as refused to acknowledge the chancellor's authority within the precincts of the university, should be punished with the utmost rigour. In this monarch's reign *lectures* were first instituted in the Hebrew language. The original lecturer, John de Bristol, a converted Jew, is said to have been a man of greater science and erudition than was common in his age, and his lectures were received with the greatest approbation.

Edward III. having been educated at Oxford, retained, during his whole life, a high veneration for the university, and was more liberal in his grants to it, than any of his predecessors. Though almost constantly engaged in plans of ambition, the execution of which has afforded matter of wonder to succeeding ages, his vast and capacious mind did not forget the interests of literature. He effected many regulations in the police of the town, highly useful, and calculated to promote the health and comfort of the numerous students by which it was frequented. While he added progressively to the power of the superior officers of the university, he was equally careful to increase the consequence and security of the scholars. He took the most decided measures to root out the ancient animosity arising from difference of country as to north and south, which had given birth to many dangerous tumults, and endeavoured to turn the current of jealousy into the channel of emulation. The state of society, however, had not yet advanced far enough to teach men to restrain their ardour in debate within the bounds of decorum. The increase of learning augmented the violence of discussion on doctrinal points, and the university became split into sects or parties, not one of which recollected that urbanity should form the basis of disputation. Among the more celebrated of the disputants at this period, were Duns Scotus, and Oakham. The former was the founder of the sect called the Nominals, and the latter the patron of the Reals. The distinction between these sects does not appear clearly upon record, but one subject of difference was the relative authority of the civil and ecclesiastical power. Oakham, who maintained the pre-eminence of the civil power, is said even to have convinced the pope himself by the influence of his oratory. He was styled by his hearers the Invincible Doctor, and his antagonist the Subtile Doctor.

The plague, which occurred in 1349, nearly ruined the university; all the colleges and halls having been deserted and shut up during its prevalence. When its rage ceased, however, the scholars began to return, and by slow degrees their studies were again resumed. Durham college was founded shortly after this event, and king Edward, in order to restore the university to its ancient splendour, confirmed all the former charters, and granted some new privileges.

The reign of Richard II. is distinguished by the appearance, at this university, of one of the brightest luminaries that had hitherto enlightened the religious hemisphere. We allude to Dr. John Wicliffe, a man whose name is yet deservedly venerated by all who regard the reformation as an occurrence favourable to the interests of Christianity, and to the progress of the human mind. This eminent character was the first warden of Canterbury college; and it was at Oxford that

that he read those lectures on divinity which laid the basis of the religious liberty we now enjoy. He loosened the shackles of papal thralldom which Henry VIII. afterwards burst asunder, though from motives of a very opposite nature to those which animated the father of the reformers.

No sooner were the doctrines of this great man divulged at Oxford, than they were approved of by the judicious, and received with enthusiasm by a large proportion of the university. So strong, indeed, was the sentiment in their favour, that when pope Gregory severely reprov'd the chancellor's neglect in suffering the heresy to diffuse itself, the proctors, and many of the masters, hesitated much, whether they should receive or reject the bull, as a new and unheard-of measure. (See WICLIFFE.) But though the spirit of the university was thus favourable to liberty of opinion, learning was by no means in a flourishing condition at this era. The number of students had greatly diminished; and many of the halls and schools were let for purposes entirely different from their original destination. Some new foundations, however, took place during this reign; but the ages which succeeded were dull and fordid in a lamentable degree. The reigns of Henry IV. V. and VI. are only memorable for the violence of the religious dissensions which prevailed, and had nearly produced a dissolution of the university. Henry VI. indeed, professed much love towards Oxford; but his affection produced no solid benefit. The finances of the university were low in his time, even to penury. Learning fell completely to decay, particularly that connected with the Latin language; and a general system of bribery and corruption degraded the church. Benefices were disposed of for interested considerations to persons not in holy orders, while men of talent, and of long residence in the university, were suffered to remain unnoticed in the seclusion of their respective colleges. Thus circumstanced, the accession of the house of York was viewed by many of the collegiates as a matter of indifference, and by some was even hailed with joy, from a hope that their situation might be bettered under the new dynasty. Nor were they deceived in their expectations, for no sooner was Edward IV. seated on the throne, than he assumed the title of "Protector of the University," and in many respects proved a zealous friend to the cause of learning. Richard III., who is commonly, but unjustly, stigmatized as the worst of tyrants, was likewise a great benefactor to the university, and an encourager of literature. Among many other judicious measures adopted by this monarch for its advancement, he passed a law, empowering the university "to import or export books at pleasure;" a permission which may be rationally construed to signify an entire freedom of the press, and liberty of discussion.

The reign of Henry VII. from a variety of fortuitous causes, is entitled to the proud distinction of having fostered, with more than common success, the revival of learning. From the many discouraging particulars of the preceding century, genuine scholarship had become almost an obsolete character, in a professional light. The Greek language had not only fallen into general disuse, but was affectingly held in contempt, by a great body of the scholars, who formed themselves into an association under the name of Trojans. So strong, indeed, were the existing prejudices against this noble and harmonious language, that when Erasmus repaired hither for the purpose of teaching Greek, several leading men in the university read lectures against him in the schools, and endeavoured to attach ridicule both to the man, and to the knowledge which it was his object to disseminate.

The period during which Henry VIII. held the sceptre, is, in some respects, one of the brightest in the annals of the university. Soon after his accession, this prince confirmed

all the grants of his predecessors, and honoured Oxford with a regal visit. Wolley, so celebrated for his unexpected elevation to the highest pinnacle of power, for his talents, and for his fall, proved himself one of the most munificent patrons of learning that graced his own or any other age. In 1518 this illustrious prelate and statesman founded seven lectures for theology, civil law, physic, philosophy, mathematics, Greek, and rhetoric, and appointed to all such men as were most distinguished for their abilities and for their knowledge in these respective branches of learning. His efforts to promote the good of the university were indeed vigorous and uniform. Through his means the Greek language was again received into estimation, and a taste for elegant literature was introduced, and this happily supplanted the quibbling sophistry which had hitherto occupied the chief attention of the learned. Wolsey also founded the college, now called Christ-church. About the same time the colleges of Brasen-nose and Corpus Christi were also founded, the former by Wm. Smyth, bishop of Lincoln, and sir Robert Sutton, and the latter by Richard Fox, bishop of Winchester.

Two events of a political nature happened in this reign, which may not improperly claim some notice in an historical sketch of the university. The first was the divorce of queen Catharine of Arragon, on the legality of which the king thought proper to consult the Oxonians; and with some difficulty succeeded in obtaining an answer favourable to his wishes. The second related to his intention of declaring himself "Head of the Church," on which subject he likewise took the sense of this university, and was confirmed in his purpose by their almost unanimous vote. It was soon perceived, however, that his object in this measure was not freedom from foreign domination, but the spoliation of the church, and, therefore, their acquiescence in his views was naturally at an end. The university now presented a most dismal spectacle. The plague, together with the calamities of the church, concurred in driving the students from their habitations, and so few in number were those who resorted hither at this era, that in the year 1546, only ten inceptors in arts, and three in divinity and law, are recorded.

The accession of Edward VI. brought with it evils of no less magnitude than those which marked the footsteps of his father. The first act of this young prince's counsellors, (for to them must belong the merit or demerit of almost every act of his reign,) was a gross infringement on the rights and privileges of the university, as it directed, "that no gownsmen should concern themselves at the election of any president, fellow, or scholar, or do any thing to oppose the visitation now ordered by the king." Accordingly, when the threatened visitation took place, the royal commissioners executed whatever measures they deemed proper. They entirely changed the form of the university government, and framed a new code of statutes, called Edward's statutes, which remained in force until archbishop Laud introduced a better model. They, moreover, despoiled the libraries, and destroyed many rare manuscripts on subjects of science, merely because they had been written by votaries of the old school. This treatment so inflamed the few remaining scholars, that the greater part of them quitted Oxford, and retired to foreign seminaries to prosecute their studies.

When queen Mary ascended the throne, the ancient forms and government were again established, and the late regulations completely abrogated. The popish party, now in their turn predominant, was not behind its antagonists in the work of cruelty and destruction. The ingenious arts were consigned to contempt; the divinity school was seldom opened; for which reason the stipend of queen Margaret's lecture was converted to the use of repairing the schools; there

was scarcely one sermon preached in the city in a month; public lectures were neglected, either through insufficiency or idleness. The Greek tongue again fell into almost total disuse, and, in general, learning, in every branch, was sunk to the lowest ebb. For six years there were only three inceptors in divinity, eleven in civil law, and six in physic. Of matters of arts there were during one year only eighteen, another nineteen, another twenty-five, and another twenty-seven, in the whole university.

The death of Mary, without issue, gave Elizabeth possession of the regal sceptre at a most critical juncture for the united interests of religion, as well as of learning. This wife and politic princeps reversed all that her sister had effected in the constitution of the university. But, unlike her predecessors, she conducted the change with gentleness and moderation. Objectionable individuals were simply deprived of their places, or induced to resign, and no greater punishment than a few days imprisonment was inflicted, even upon the obstinate opposers of the queen's measures. These, however, were some time before they produced the desired effect of restoring the university to any tolerable degree of prosperity. The shock occasioned by the versatile state of the court-religion, during the three previous reigns, and the consequent uncertainty of ecclesiastical provision, was not to be quickly overcome. In the year 1560, not one person performed theological exercises in the schools, and only one in civil law, and three in physic. No divine, legit, or physician, stood that year for a degree. In 1563 there were only three university preachers in Oxford, and two of these shortly afterwards retired. Hence the pulpit was frequently supplied by laymen. Mr. Taverner, sheriff of Oxfordshire, mounted the pulpit, with his sword by his side, and his golden chain of office round his neck, and preached a sermon to the academics. This event sufficiently evinces that the condition of ecclesiastical literature must have been low indeed, or the Oxonians never could have listened to such flagrant absurdity as the following. "Arriving at the mount of St. Mary's," says this preacher at the commencement of his sermon, "in the stony stage where I now stand, I have brought you some fine biscuits baked in the oven of charity, carefully conserved for the chickens of the church, the sparrows of the spirit, and the sweet swallows of salvation."

In the 13th year of queen Elizabeth the two universities were incorporated by act of parliament; and two years subsequent, the obligation of subscribing the articles of the church of England began to be rigidly enforced on all who entered into the ministry. This occasioned considerable disturbance, as there were many persons in the university who favoured the puritanical doctrines, and peremptorily refused their assent to the proposed articles. The chancellor (the earl of Leicester) was strongly tinctured with Calvinistic sentiments; and sir Francis Walsingham, the queen's secretary, was notoriously a partisan of the Puritans. Hence sectarian principles unavoidably gained ground; but notwithstanding the university rapidly rose in consequence, and could boast among its members numerous individuals eminent for their proficiency in almost every branch of the liberal arts or sciences. Queen Elizabeth twice visited the university, and on one of these occasions delivered a Latin speech, extempore, with so much ease and correctness, as excited the surprise of all who heard her. (See Nichols' Account of "Queen Elizabeth's Progresses.") In this reign sir Thomas Bodley founded the Bodleian library, which has proved an highly useful and valuable addition to the university.

The reign of James I. is remarkable in the annals of the university for the privilege it then acquired of sending two

representatives to the national council. In this era, the disputes between the Papists, Episcopalians, and Puritans, were carried to a great height, and proved highly injurious to the interests of solid learning, by inducing too eager a thirst for controversial inquiry. On this account sir Henry Savile informs us, "that geometry was almost totally unknown and abandoned;" and hence we may fairly presume that many of the other sciences were in a similar state of decay and neglect.

Charles I., in the early part of his reign, conferred some important benefits on the university. At the intercession of the chancellor, the celebrated archbishop Laud, he granted to it a new charter, in which its ancient liberties and privileges were explained and confirmed; and new ones were added. This charter was sealed with the great seal of England, and to distinguish it from other grants, it was denominated the *Caroline charter*. In 1636, the statutes of the university, after being corrected and enlarged, and approved of by the heads of the colleges, received the royal sanction; and in 1638 the statute, ordering the examination of all candidates for degrees, was first put in execution. During the rebellion, which broke out shortly after, the university maintained an inviolable allegiance to the unfortunate monarch; and even when the parliament mastered the kingdom, and commissioners were deputed to reform the discipline, and correct the erroneous doctrines of the university by the rule of covenant, the great majority of its members met in convocation, and passed a public act and declaration against the proffered opinions. "An act," observes lord Clarendon, "which must remain to the world's end, as a monument of the learning, courage, and loyalty of this excellent place."

But the firmness of the university was of little avail in checking the religious fanaticism which at this period possessed the minds of the predominant party. The dean and chapter's lands were sold; the Episcopalian divines were ejected; the libraries were pillaged; and some of the more zealous votaries even proceeded so far as to destroy the ornaments and decorations of the several colleges, without regard to the circumstance whether they bore relation to matters of religion, or not. Classical learning now experienced a total stagnation. The candidates for holy orders were no longer required to be men of science and polite erudition: it was enough if they "abounded in grace," and were "endowed with the spirit of preaching." Still, amidst this melancholy scene of religious bigotry, a few men of real talent inhabited the more shady recesses of the university, and kept alive the dying embers of genuine knowledge. These individuals met together at stated periods, to communicate to each other their respective discoveries in physics and geometry; and thus laid the foundation of the Royal Society, the most honourable and scientific institution of which our country can boast. Cromwell, who was elected chancellor of Oxford in 1650, gave several proofs of his predilection for learning, but the temper of the times is supposed to have checked his efforts for its revival and encouragement. On the restoration, however, this sentiment being in a great measure removed, the university was again replaced on its former basis. The lands of the dean and chapter were restored, and most of the persons who had suffered expulsion on account of their principles, were reinstated in their respective collegiate stations. Learning once more began to flourish, and some of those who were the proudest boasts of science and of literature matured their studies, or laid the foundation of their future eminence here, in the reign of the second Charles.

But this pleasing aspect of affairs did not continue long; violent party contentions disturbed the peace of the university

sity during the whole reign of James II., who exhibited a signal proof of his determination to subvert the civil and religious liberties of the country, in his conduct towards Magdalen college. It happened that shortly after he had ascended the throne, the president of that establishment died; and the king transmitted an order for the election of a person named Farmer as successor in that office. The fellows, however, knowing that this Farmer was a man of contemptible character, petitioned his majesty either to leave them the freedom of choice which their statutes entitled them to assume, or to propose a more respectable individual for their head. James took no notice of this application, so that when the day of election arrived, the fellows elected Dr. Hough for president. This measure roused the vengeance of the monarch, who sent down an inferior ecclesiastical commission, the persons entrusted with which consented to withdraw Farmer, upon condition that Parker, then lately created bishop of Oxford, should be chosen in his stead. But this prelate being likewise a man of low character, and strongly inclined to popery, the collegiates firmly adhered to their original election, and urged the tenor of their statutes in defence of their resolution. Their arguments, however, had little weight with the king, who viewed their refusal to obey his mandate as an act bordering on rebellion. He therefore repaired to Oxford in person, and commanded the fellows to appear before him at Christ-church; but finding that even his own presence could not influence their decision, he expelled the whole of them, except two, from the college. This conduct of the monarch excited the detestation of all friends to cool reason and upright government; and in 1688, when James became alarmed by the preparations of the prince of Orange to invade his dominions, one of the first measures he adopted to conciliate his subjects, was the re-instatement of the expelled members of Magdalen college.

From the period of the revolution to the present day, the university of Oxford has continued to flourish in an unexampled degree. Its revenues have been increased, and the system of education has generally kept pace with the improvements which have happily been accomplished in almost every branch of human science. The doctrines of the schools, indeed, were received and taught here for some time after they had been exploded in the northern universities, but they have now yielded, as in other seminaries, to the more rational views of the experimental philosophy. For some remarks on the state of national learning during the last century, and the peculiar features of university tuition, discipline, and influence, see UNIVERSITY.

Present State of the University, its Officers, &c.—The university, as a corporate body, has been governed by statutes enacted at different periods, and sanctioned by charters granted in different reigns. Those at present in force were chiefly drawn up in 1620, and were confirmed, as already mentioned, by king Charles I. in the year 1635. In that charter the corporation is styled "The Chancellor, Masters, and Scholars of the University of Oxford," and this body is vested with the power of framing laws for its own government.

The principal officers of the university are, the chancellor; the high steward; the vice chancellor; two proctors; a public orator; a keeper of the archives; a registrar; numerous public lecturers and professors; two curators of the theatre; two clerks of the market; the Bodleian librarian, and the keeper of the Ashmolean museum. The first five mentioned officers are invested with magisterial authority, and have the power of appointing deputies.

The *Chancellor* is chosen by the members of convocation, and now holds his office for life, though formerly it was an-

nual, or at most triennial. It is a station of great dignity, and is usually filled by a person of the first eminence in the kingdom. The duties of the chancellor are to superintend the interests of the university, to defend its privileges, and to decide, either in person, or by deputy, in all civil questions in which a member happens to be involved. For this purpose he is empowered to hold regular courts; he likewise presides, if present, at all university meetings, and possesses an absolute negative on their proceedings. The present chancellor is the right honourable lord Grenville, who was elected in the year 1809.

The *High-Steward* is nominated by the chancellor, but must be approved of by convocation. He holds his office for life, and is bound to assist the chancellor, vice-chancellor, and proctors, in the execution of their several duties, and to sit in judgment in capital causes, where a member of the university, or a privileged person, is the party offending. He likewise holds the university court-leet either in person or by deputy. Lord Eldon, lord high chancellor of Great Britain, the present high steward, was elected in 1801.

The *Vice-Chancellor*, who is always the head of some college, is appointed by the chancellor, and admitted, and sworn, in convocation. This office is annual, but the same individual is usually named for four successive years. The vice-chancellor nominates four deputies, or pro-vice-chancellors, who must likewise be heads of colleges. His duties are to enforce the university regulations, to call congregations, convocations, and courts, license taverns, expel delinquents, &c. The present vice-chancellor is John Cole, D.D. rector of Exeter college, appointed in 1810.

The *Proctors* are masters of arts of at least four years standing, and not more than ten from their regency. They are elected by the common suffrage of all doctors and masters of arts in their respective colleges, according to a cycle ordained in the Caroline statutes, and have each the right of appointing a deputy. Their business is to assist the vice-chancellor in convocations and congregations; to superintend the scholastic exercises, to enforce the statutes, and to preserve the public peace. Their names in 1812, were Charles Wightwick, and Thomas Davies.

The *Public Orator* is chosen by convocation, and must either be a bachelor of civil law or a master of arts. He is the secretary, or organ of the university, writes letters and addresses on public occasions, and delivers the annual Crewian oration alternately with the professor of poetry. He likewise presents the honorary degree of M.A. to those on whom it may be conferred. The Rev. Wm. Crowe is the present public orator.

The *Keeper of the Archives* is elected by convocation, and is entrusted with the care and arrangement of all records and charters belonging to the university, and on certain occasions is appointed to defend its rights and privileges. This office is now vested in Whittington Landon, D.D. provost of Worcester college.

The *Registrar* attends all university meetings, and registers all its acts; such as dispensations, graces, &c.; takes copies of all letters sent or received, and collects the university rents. This officer must be M.A. or B.C.L. and notary public. The Rev. John Gutch, M.A. the continuator of Wood's history, &c. of Oxford, has long held this respectable office.

The *Professors and Lecturers* are public officers, who have certain salaries allowed to them, on some foundation, and who are, in consequence, required to deliver lectures annually, on such subjects as the founders may have appointed in their charters, or wills. The lectureships at present in Oxford are twenty-five in number, and are as follows.

The

The Regius professorships of divinity, civil law, medicine, Hebrew, and Greek, founded, about the year 1535, by Henry VIII. and endowed by him with a yearly revenue of 40*l.* each, which has since been augmented by additional endowments.

The Margaret professorship of divinity, founded by Margaret, countess of Richmond, mother of Henry VII., in 1497.

The professorship of natural philosophy, founded by the executors of sir William Sedley, of Aylesford, in Kent, who left 20,000*l.* by will, for that purpose.

The Savilian professorships of geometry and astronomy, founded, in 1619, by sir Henry Savile, *knt.* These professorships are open to men of every nation.

The Camden professorship of ancient history, founded by William Camden, Clarencieux king at Arms, in 1622. It is singular that our valuable chorographer did not institute a professorship of topography or antiquities.

The anatomical lecture, founded by Richard Tomlins, A.D. 1623, is annexed to the Regius professorship of medicine.

The professorship of music, founded in 1626, by William Heather, Mus. Doct.

The Laudian professorship of Arabic, founded and endowed by archbishop Laud, in 1636.

The professorships of botany, one of which was founded by D. W. Sherard in 1728, and the other by his present majesty, in 1793. The botanic garden was founded by the earl of Danby, in 1632.

The professorship of poetry, founded by Dr. Henry Birkhead, in 1708.

The Regius professorship of modern history and modern languages, founded by George I. in 1724.

The Anglo-Saxon professorship, founded by Richard Rawlinson, LL.D. in 1750, though the endowment did not take effect till 1795, as ordered by his will, dated June 2, 1752.

The Vinerian professorship of common law, founded, in 1758, by the university, in conformity to the will of Charles Viner, *esq.* who bequeathed 12,000*l.* for that purpose. The celebrated sir William Blackstone was the first professor on this foundation, and gave it high distinction by his admirable "Commentaries," which were first read here, and have since passed through several editions.

The Clinical professorship, founded in 1772, with funds left by the earl of Lichfield, then chancellor of the university. The lectures are delivered in the Radcliffe infirmary.

The lord almoner's reader, who is paid out of the almonry bounty.

The Aldrichian professorship of anatomy, of the practice of medicine, and of chemistry, founded in 1803, under the will of Dr. Aldrich. The first is annexed to the professorship of anatomy.

The Bampton lectures on certain subjects in divinity, founded by John Bampton, M.A., canon of Salisbury, in 1780. The office is annual, and the same person cannot officiate twice.

The *Curators of the Theatre* are two officers appointed by convocation to take charge of the building so called, in which the public meetings of the university are held on great occasions.

The *Clerks of the Markets* were instituted for the better care and government of the market. Their duty is to regulate the affise of bread, to observe the weights and measures, the prices and quality of provision, and to fine fore-stallers, regraters, &c.

The *Bodleian Librarian* is elected by convocation, and the office must be supplied within three days after it has become vacant, except during the long vacation, when three weeks are allowed. The Rev. John Price has inherited this office for 44 years.

The *Keeper of the Ashmolean Museum* is appointed by the visitors of that curious repository. This office was endowed with a salary by Dr. Rawlinson, with the singular restrictions, "that the keeper should be a layman, of the degree of M.A. or B.C.L. only, unmarried, and neither F.R.S., nor F.S.A."

The whole business of the university, in its corporate capacity, is conducted in two separate assemblies, called the "House of Congregation," and the "House of Convocation."

The *House of Congregation* is constituted entirely of regents; either of necessary regents, or regents *ad placitum*. Of these, nine at least, besides the vice-chancellor and proctors, are required to make a congregation. The business of this assembly refers chiefly to the passing of graces and dispensations, and to the granting of degrees. All votes are given secretly, by whisper in the ear of the proctor; and in the instance of supplicating for graces, every member has a suspending negative in three successive congregations.

The *House of Convocation*, which is composed of regents and non-regents alike, but with certain limitations, is privileged to investigate and determine every subject, in which the interest of the university is concerned. In this assembly, laws are enacted, altered, or explained, without restriction, unless the statute proposed to be altered be a Caroline statute, and then the royal consent must be previously obtained. In both these meetings, the chancellor or vice-chancellor singly, and the two proctors jointly, are officially empowered to negative every proceeding. All questions are decided by a majority of votes; and all elections, except for members of parliament, are conducted by a private scrutiny in writing.

The *Hebdomadal Meeting* is a sort of committee or council to both houses, and consists of the vice-chancellor, heads of colleges and halls, and proctors, who are empowered to deliberate on all matters relating to the privileges, statutes, and customs of the university, and report on them in convocation, or congregation.

The several *degrees* conferred by the university of Oxford are those of doctors of divinity, civil law, medicine, and music; of bachelors in these sciences, and of masters and bachelors of arts. For the attainment of each of these degrees, a residence for a certain number of terms is required. **SEC DEGREE.**

Colleges and Halls.—Having thus given a general view of the university and of its officers, we proceed to notice its several foundations separately. Of these, twenty are distinct, endowed corporations, and are termed colleges; and five are halls, or buildings appropriated for the residence of students, under the superintendence of a principal, who receives rent for their chambers. The following is a list of these institutions, according to the date of their respective charters of foundation.

Colleges.

1. Merton College, founded	-	A.D. 1264
2. University College	-	1280
3. Balliol College	-	1281
4. Exeter College	-	1314
5. Oriel College	-	1326
6. Queen's College	-	1340
7. New		

7. New College, founded	- - -	A.D. 1386
8. Lincoln College	- - -	1427
9. All-Souls College	- - -	1437
10. Magdalen College	- - -	1456
11. The King's Hall and College of Brasen-Nose	- - -	1509
12. Corpus Christi College	- - -	1516
13. Christ-Church	- - -	1525
14. Trinity College	- - -	1554
15. St. John's College	- - -	1557
16. Jesus College	- - -	1571
17. Wadham College	- - -	1613
18. Pembroke College	- - -	1620
19. Worcester College	- - -	1714
20. Hertford College	- - -	1740

Halls.

1. St. Alban's Hall, about	- - -	1200
2. Edmund Hall	- - -	1317
3. St. Mary's Hall	- - -	1325
4. New Inn Hall	- - -	1391
5. St. Mary Magdalen Hall	- - -	1480

Merton College, which is the oldest in point of legal establishment in the university, was founded by Walter de Merton, bishop of Rochester, and lord chancellor of England, who began to erect the buildings about the year 1260, and established the college by charter, dated January 7, 1264, under the appellation of "Domus Scholiarum de Merton." A second charter was granted in 1270, and a third in 1274; both confirming the original deed, and adding new privileges and possessions to those previously conferred. The first officers of this college were nominated in 1276, about two years after the completion of the buildings. Its chief benefactors, besides the founder, were Ella, countess of Warwick, about the year 1295; John Willyott, chancellor of Exeter, in 1380; Dr. Thomas Jessop, physician, in 1595; William Rede, bishop of Chichester; and Sir Thomas Bodley. This college is situated in St. John's Street, to the east of Corpus Christi, and its buildings are arranged round three courts or quadrangles. The outer court to the street was rebuilt in 1589, with the exception of the tower and gate-house, which were constructed in the early part of the 15th century, in the wardenship of Thomas Rodburne, bishop of St. David's, and one of the most distinguished mathematicians of his age. Within this court are the warden's lodgings, some portions of which are supposed to be coeval with the original edifice. The second or grand court is of modern date, and exhibits a mixed style of architecture: the centre elevation is adorned with four tiers of columns, or four orders of architecture; but the third or small court is of ancient erection, and is supposed to have been entirely built about the same time with the library, which forms its south and west sides. This library was founded in 1376, by the bishop of Chichester above mentioned, and is the oldest structure, distinctly appropriated as such, in the kingdom. In 1550, when the work of reformation was conducted, in some instances, with more zeal than judgment, many of the printed books and MSS. belonging to this institution were either sold or destroyed. Upon the restoration of the library, however, by Sir Thomas Bodley, a considerable part of them was recovered by the liberality of those private individuals by whom they had been purchased. The hall of this college is remarkable, as having been the room in which queen Elizabeth was entertained at dinner, on the occasion of her visit to the university, with her privy council, in 1592.

The number of students at Merton college has varied at

different periods, and appears to have been regulated by the changes which occurred in its revenue. In 1612, the society consisted of ninety-three members, but at present there are only forty-eight; a warden, twenty-four fellows, two chaplains, fourteen post-masters, four scholars, and two clerks. The warden is chosen from among the fellows, who present a list of three to the archbishop of Canterbury, by whom one of them is appointed to the office. The first common room, used in any college in Great Britain, was fitted up here in 1661. Among the more eminent members of Merton college were Duns Scotus, Wicliffe, Sir Henry Savile, Dr. Harvey, the discoverer of the circulation of the blood, the celebrated Drusius, and Robert Devereux, earl of Essex, the parliamentary general, whose character is so ingenuously drawn by Lord Clarendon.

University College, as already noticed, is said to have owed its origin to King Alfred. Smith, in his history of this college, has proved to the satisfaction of every unprejudiced mind, that it was founded by the university, with the money of William of Durham, who died at Rouen in Normandy, in the year 1249, and bequeathed 310 marks to purchase certain annual rents for the maintenance of ten, eleven, twelve, or more masters. At first, the funds left by this benefactor were appropriated to the support of a limited number of individuals, (chosen from the various halls of the university,) who did not form an independent society, but were severally subordinate to the schools in which they had been educated. In 1280, however, they were constituted a society by themselves, under certain conditions; and in 1292, their privileges were confirmed and enlarged by a body of statutes. The situation of their house, or hall, at this period, is uncertain; but historians have generally placed it on part of the site of Brasen-nose college, and assert that they removed to the present college, in the High-street, about the year 1343. On this removal, they styled themselves the Masters and Scholars of the Hall of the University of Oxford, and their house University-hall; but in 1381, the latter began to be called Great University-hall. When the term college was first applied is not ascertained, nor is it known at what time the corporation was completed. This, however, most probably did not take place till about the year 1475, when the body of statutes, still in force, were enacted; but a common seal was used as early as the year 1320.

Numerous benefactors to this college appeared within the first century after its foundation; and in 1403 Walter Shirlaw, bishop of Durham, gave the manor of Mark's-hall, in Essex, for the maintenance of three fellows, natives of York and Durham. Henry, earl of Northumberland, in 1442, gave lands and the advowson of a rectory to support three bachelors or masters of arts from the dioceses of Durham, Carlisle, and York. In 1566, Joan Davys, wife of a citizen of Oxford, gave certain estates for the establishment of two logic lecturers, or one in logic and another in philosophy; and for an augmentation of the allowance to the masters and fellows. Francis Russell, second earl of Bedford, Robert Dudley, earl of Leicester, John Freynton of Altofts in Yorkshire, the Rev. Robert Gunsey, and Sir Simon Bennet, were likewise very considerable donors. But the greatest benefactor of modern times was Dr. Radcliffe, who, besides rendering munificent assistance toward improving the buildings of the college, instituted and endowed two travelling fellowships for students in medicine. Each fellow receives 300*l.* per annum for ten years, the first five of which he is required to spend abroad.

University college stands on the south side of High-street, and consists principally of two quadrangular courts, one of which

which was built at various times between the years 1634 and 1675. It is one hundred feet square, with a chapel and hall on the south side. The other court, which was chiefly erected by Dr. Radcliffe, has only three sides, the fourth opening to the master's garden. These two quadrangles form a grand front towards the street, of about 260 feet in length, with two tower gateways. The chapel of this college was built in 1665, and displays much painted glass in the windows. It also contains a cenotaph to the memory of sir William Jones, the celebrated orientalist, which was designed and executed by John Flaxman, R.A., and is highly creditable to the talents of the artist. The bas-relief is surmounted by tigers' heads, and represents the lamented subject of the funeral trophy engaged in a digest of the Hindu code, with Brahmans in attendance. The library here was completed in 1669, and is furnished with a very valuable collection of books and MSS.

Balliol college owes its foundation to John de Balliol, of Bernard's castle, in the county of Durham, father to the unfortunate king of Scotland of the same name. This gentleman, who possessed a taste for literature, and a benevolence of disposition little prevalent in the thirteenth century, commenced it in the year 1263, and intended that it should maintain sixteen poor scholars of Oxford. He died, however, without having effected the design, and so suddenly that he left no will, but verbally enjoined his lady and executors to take charge of and give permanency to his infant institution. Lady Dervorgille accordingly, at the instigation of her confessor Richard Slickbury, hired a house on the site of the present college; and was so fortunate as to meet with the concurrence of the founder's executors in all her subsequent steps to perpetuate the establishment. In 1282 she appointed statutes under her seal, which are interesting, because they serve to throw some light on the modes of collegiate discipline at that early period. In 1284 the lady Dervorgille purchased a tenement called Mary's-hall, and having repaired and enlarged it, transferred the scholars to this new residence, which was henceforth called New Balliol college. The same year she presented them with some lands in the county of Northumberland, and had their statutes confirmed by Oliver, bishop of Lincoln, and by her son John de Balliol, who at that time held the Scottish sceptre under the protection of Edward I. But notwithstanding these generous efforts, the revenues of the college still continued extremely small, not yielding above eight-pence *per* week to each scholar. A number of benefactors, however, soon arose, and by their united contributions conferred a considerable degree of opulence on the institution. In 1294, Hugh de Wychenbroke gave the advowson of St. Lawrence, Old-Jewry, London; and in 1310 Hugh de Warkenby, and William de Gotham, gave four messuages, in School-street, for the support of a chaplain to officiate in the oratory. In 1320, Richard de Hunsinfore also gave a tenement in Oxford; but these donations were trivial compared with the liberal gifts of sir William Fenton, and sir Philip Somervyle. The benefaction of the latter, indeed, was deemed so considerable as to entitle him to the honours of a second founder. A new body of statutes was drawn out under his sanction, one article of which enacted, that the society should henceforward be governed by a master. These statutes were confirmed by Edward Balliol, king of Scotland, and remained in force till 1364, when a third code was enacted by Simon de Sudbury, afterwards archbishop of Canterbury. In 1507 this code was likewise superseded, and the one at present in force substituted in its stead. Among the various benefactors since that period, the most distinguished were Thomas Harrope, rector

of Hasely; Peter Blundell of Tiverton in Devonshire; lady Elizabeth Periam of Greenland, in Berkshire, sister to the great lord Bacon; Dr. John Warner, bishop of Rochester; and John Snell of Warwickshire. The two last gave donations exclusively for the benefit of Scotch scholars.

As in Merton college, the members of this society have varied in number at different periods, according to the state of its finances. In 1612 the society consisted of one hundred and twenty-seven persons, but at present the number is reduced to a master, twelve fellows, fourteen scholars, and eighteen exhibitioners. The visitor is elected by the college, which is the only one in the university that enjoys a like privilege. John Wicliffe, the celebrated reformer, was one of the masters of this college.

The buildings of Balliol college were erected at various times on the site of the tenements or halls hired and purchased by the lady Dervorgille, and are chiefly arranged round a quadrangle, which is 120 feet long and 80 broad, in the interior. The front towards the street presents much irregularity of structure. Over the entrance, in the centre, is a fine square tower, embattled at the top, with an oriel window in front, also a highly enriched and canopied niche on each side. This gateway is likewise adorned with the arms of Balliol. The buildings to the east and west of the tower were constructed at the beginning of the last century, and possess little consonance of character with the older portions of the college. Within the court the same dissimilarity of architecture is visible as on the outside. The hall, and the residence of the master, occupy its western side; the northern side is composed of the chapel and library, and the other sides are appropriated as lodgings for the fellows and scholars. The library was built in two parts, that towards the west by Dr. Chace, A.D. 1427, and that on the east by Robert Abdy in 1477. The interior of the whole has been lately renewed under the superintendence of James Wyatt, architect. Formerly this library was esteemed among the first in the university. Before the time of Edward VI. it was particularly rich in MSS., above two hundred of which, highly illuminated, were presented by Grey, bishop of Ely, in 1454. Most of these, however, have been since lost or destroyed, but the collection of printed books is still both valuable and extensive.

Besides the quadrangle, there is an area on the north-west, consisting of several detached lodgings for the students. These were purchased and made over to the society by archbishop Abbot. There is likewise a building belonging to the college, at the south-west angle of the quadrangle fronting the street. It was erected at the expence of Mr. Fisher, late fellow of Balliol.

Exeter college was founded in the year 1315, by Walter de Stapleton, bishop of Exeter, who was likewise the founder of Hert or Hart hall, now Hertford college, the origin of which is so intimately blended with that of Exeter college, that it is difficult, at least for some time, to consider them as separate establishments. The rector and scholars of Hart hall, indeed, were actually the first possessors of this college, having been removed to the buildings which formerly occupied the present site, and others dependent on them substituted in their stead. According to the statutes then formed, the society was to consist of thirteen members, eight of whom were to be chosen from Devonshire, four from Cornwall, and one, a priest, nominated by the dean and chapter of Exeter, from any part of the kingdom. The chief benefactors of this institution were Edmund Stafford, bishop of Exeter, who added two fellowships, and reformed the statutes in 1404; and sir William Petre, who procured a new body of statutes, and a regular deed of incorporation for

for the college in 1565. The same gentleman likewise endowed eight new fellowships. The other considerable contributors to the prosperity of this establishment, were sir John Ackland; king Charles I.; sir John Maynard; Samuel Hill, rector of Warlegan; and the lady Shiers. In 1612, the society of Exeter college consisted of 206 persons. The present members are a rector, twenty-five fellows, one scholar, who is bible clerk, and ten exhibitioners, besides other students. The bishop of Exeter is visitor.

The buildings of this college encompass a single quadrangle. The grand entrance facing the street is surmounted by a tower with Ionic pilasters, which supports a semicircular pediment, ornamented with the arms of the founder on a shield surrounded with festoons. The inner front is of similar construction; but the arms here are those of lord Petre. More uniformity prevails in the architecture of this college than in any of those hitherto noticed; and, on the whole, its appearance is simple and pleasing. The chapel, which occupies a large portion of one side, is a neat and solid edifice in the later pointed style, and possesses the peculiarity of having two aisles. The hall is a handsome building, also in the pointed style, erected by sir John Ackland about the year 1620; but the library is of modern erection, and contains, among other valuable works, a fine collection of Aldine classics.

Oriel College was founded, about the year 1324, by Adam de Brom, rector of St. Mary's in Oxford, under the sanction of Edward II., to whom he afterwards surrendered the whole, in the hope of obtaining the royal protection for his infant establishment. Nor were his expectations groundless, for the king readily took the college under his especial care, and the next year granted a new charter, appointing it a college for divinity and the canon law, to be governed by a provost. He likewise bestowed upon the society some tenements in Oxford, and the advowson of St. Mary's church, on condition of their providing chaplains for the daily service. Adam de Brom was named the first provost, and drew up a code of statutes in 1326, by which the college was to consist of a provost, ten fellows or scholars, seven to study divinity, and three the canon law. He likewise gave them the livings of Aberforth in Yorkshire, and Coleby in Lincolnshire; and in 1327 Edward III. bestowed upon them a large messuage called La Oriole, or Oriel, to which the members soon after removed; and hence the college derived its present name. The chief subsequent benefactors of this institution were John Franke, lord chancellor of England in 1441; Carpenter, bishop of Worcester; Smyth, bishop of Lincoln; Dr. Richard Dudley, chancellor of Sarum; Dr. Robinson, bishop of London; Dr. Carter, provost of the college in 1708; Charles, fourth duke of Beaufort, and her majesty queen Anne. By some of these benefactors fellowships were founded, so that the society now consists of a provost, eighteen fellows, fifteen exhibitioners, and other students. The lord chancellor is the visitor.

The buildings consist of a large quadrangle, and two lateral ranges of chambers for the reception of students, with a library between. The whole of the quadrangle was rebuilt in the early part of the 17th century, and both exteriorly and interiorly possesses uniformity of style and construction. The front, towards the street, is divided by a square tower, which rises over the entrance, and is ornamented with a bay window or oriel. The hall faces the gateway, and is approached by a flight of steps under a portico, surmounted by statues of Edward II. and III. in niches, with the virgin and child in another niche, immediately above. The provost's lodgings are on the north side; and the buildings

on the south and west are entirely appropriated for the accommodation of students. The library was designed by James Wyatt, esq. architect, and executed under his direction. It contains, among many other books, a very curious and valuable collection, which was bequeathed to the society by Edward, lord Leigh of Stourleigh.

Queen's College was founded by Robert Eglesfeld, confessor to queen Philippa, the illustrious consort of Edward III. The founder was descended from an honourable family in the county of Cumberland, and appears to have been deservedly held in high estimation by his royal master and mistress, as he employed his interest at court chiefly in promoting religion and learning. Anxious to supply the means of education to the border counties, in which, to use his own expressions, "an unusual scarcity of literature prevailed," he purchased some tenements on or near the site of the present buildings, and obtained a charter, dated January 18, 1340, from Edward III., to constitute a collegiate hall under the name of "Aula Scholarium Regine de Oxon." a title which seems to imply that the queen had some share in its institution. At all events, she took it immediately after under her protection, and, in consequence, the honorary patronage of the college has ever since pertained to the queens of England. By the original charter and statutes of this establishment, the society was to consist of a provost and twelve fellows or scholars; the provost to be in holy orders, and chosen from among the fellows, who were to be natives of Cumberland and Westmorland, in the first instance; and afterwards of those counties in which the college possessed property. This number, however, has since been increased by various benefactions, but by none so much as by that of John Michel, esq. of Richmond, who bequeathed to Queen's college estates valued at 700*l.* a-year, for the maintenance of eight master fellows, four bachelor scholars, and four under-graduate scholars, or exhibitioners; and for the erection of suitable buildings for the accommodation of the masters and scholars; so that this has been considered in the light of a new foundation. The queens who have contributed to the college, besides queen Philippa, are Henrietta Maria, consort to Charles I., the late queen Caroline, and her present majesty. The first gave three rectories and as many vicarages, and the two last presented 1000*l.* each towards enlarging and repairing the buildings, which now consist of two courts, divided by the hall and chapel, and forming an oblong 300 feet long and 220 broad. With the exception of the chapel, the whole of this college was erected during the last century. The style of its architecture is, therefore, modern. The principal front is in the High-street, and has in the centre a large gateway, over which is a statue of queen Caroline, under a cupola supported by pillars. This gateway leads into the first court, which bears, in general, a remarkable resemblance to the Luxembourg palace at Paris. It was executed by Hawksmoor, from a design either by sir Christopher Wren, or by Dr. Lancaster. The principal library-room is one of the largest in the university, and is arranged in a very tasteful manner. Here are two very ancient paintings on glass of Henry V., who received his education at this college.

New College is indebted for its origin to William de Wykeham, bishop of Winchester, one of the most illustrious characters of his age. This prelate was born in 1324, and rose through successive gradations to the highest offices of the state, and to the greatest influence in the church. (See WYKEHAM). He originally founded the society of New college about the year 1373, and established the members in halls, which he hired for their reception, till a college could

be erected. Of this college he laid the foundation-stone in 1380, under the authority of the king's licence, and likewise of the pope's bull; but the buildings were not completed for a period of six years. As soon as they were, however, the society was removed into them, and took possession with great solemnity. The same year, bishop Wykeham began his collegiate establishment at Winchester, which was to serve as a nursery to that of Oxford, so grand and comprehensive was the original design of this distinguished benefactor. Both societies, by their respective charters and statutes, were made to consist of a warden and seventy scholars, besides priests, clerks, and choristers, for the service of the chapels. That of Winchester had likewise a school-master and usher, and was to supply students to the Oxford college, by election, and to submit to an annual visitation from the warden and two fellows of the latter. Many special privileges were at this time secured to New college, of which one was, that the fellows should be admitted to all degrees in the university, upon being found qualified by examinations conducted, according to form, in their own college. This right was questioned in 1608, but decided by the then chancellor, archbishop Bancroft, in favour of Wykeham's foundation.

Many benefactors have contributed to augment the prosperity of this college besides the founder, but only one appeared during his life-time. This was John de Buckingham, bishop of Lincoln, who presented to the society the advowson of Swalcliffe church, together with some adjacent lands. Of the subsequent donors, the principal were Thomas Beckington, bishop of Bath; Robert Shireburn, bishop of Chichester; John Smyth, a burgher of Ipswich; Dr. Fleshmonger, dean of Chichester; and Christopher Rawlins, vicar of Alderbury in 1589. By the assistance of these, and numerous smaller benefactions, this society became one of the richest in Oxford, its yearly revenues being reckoned at 1000*l.* in 1592, when it consisted of one hundred and thirty persons. The present members are a warden, seventy fellows, ten chaplains, three clerks, a sexton, and sixteen choristers. The whole of the fellows must be elected from Winchester, at a regular meeting for that purpose, which is attended by the wardens of both colleges, two fellows of New college, and the subwarden and head master of Winchester. The visitor of New college is the bishop of Winchester. In the original charter of foundation, this college is entitled "*Seinte Marie College of Wynchestre*;" but having popularly received the name of New college at the time of its erection, it has, by a remarkable inattention to propriety, retained that appellation through every succeeding age.

The buildings of this college are extensive, diversified, and interesting. As originally projected by the founder, they consisted of a spacious quadrangle, including the chapel, hall and library, with a small quadrangle adjoining, called the cloisters. The other buildings which form the garden court constitute an addition to the original design, and were built in 1684, in imitation either of the palace of Versailles, or of the king's house at Winchester. The approach to the great quadrangle is by a portal, with a tower above, which still retains the sculptured effigy of Wykeham in one of its ornamented niches. The chapel and hall on the north side of the great court present as fine an elevation as any in the university. The former is peculiarly beautiful and chaste in its interior decorations. The choir of this structure is 100 feet long, 35 broad, and 65 high; and the anti-chapel, running at right angles into the choir, measures about 80 feet in length by 36 in breadth. The windows of the latter division afford a magnificent display of painted glass, in four

different styles of execution. None of them, however, come near, either with respect to design or beauty of colouring, to the great west window, which probably equals any similar effort in the pictorial art in Great Britain. It was executed by Jervais from finished cartoons by sir Joshua Reynolds, and is divided into two parts, the higher representing the Nativity, and the lower seven figures emblematic of the Christian and cardinal virtues. The famous crozier of the founder is preserved in this chapel: and over the altar table are some beautiful specimens of sculpture from the chisfel of Richard Westmacott, esq. R.A.

Lincoln College.—The original institution of this college took place in 1427, when Richard Flemming, bishop of Lincoln, obtained the royal licence to establish a society of one rector or warden, seven fellows, and two chaplains in the church of All-Saints, Oxford, and to unite to that church those of St. Mildred and St. Michael, under the general name of the first. This society he appointed perpetual parsons of the collegiate church, and intended to have erected buildings for the reception of its members, but was prevented by death from executing his benevolent views. They continued to reside, therefore, in a tenement called Deep-hall, till the original design of the present college was completed by the munificent exertions of bishop Rotheram, who was afterwards archbishop of York. This prelate likewise increased the number of fellows from seven to twelve, and framed a body of statutes for the government of the society. Various other benefactors have arisen since that period, among whom bishop Smyth, the founder of Brazen-Nose, Edward Darby, M.A. archdeacon of Stow, and Nathaniel, lord Crew, bishop of Durham, were the principal; the society now consists of a rector, twelve fellows, eight scholars, twelve exhibitioners, and a bible clerk. The bishop of Lincoln is visitor.

The chief buildings of this college compose two quadrangular courts. The first court, begun soon after the founder's death, and finished by bishop Rotheram, still retains much of the character of ancient collegiate structures. It contains the hall, the library, the rector's lodgings, the common room, and some apartments for scholars, all of which are of low elevation, and arranged with great simplicity. The other quadrangle was erected about the year 1612, with the exception of six sets of rooms, which were added in 1759. The chief ornament of this court is the chapel, built at the expence of Dr. John Williams, bishop of Lincoln.

All-Souls College was founded, in the year 1437, by Henry Chichele, archbishop of Canterbury, who prevailed on king Henry VI. to assume the title of co-founder. Chichele, however, retained all legislative power respecting the new establishment, and drew up a code of statutes, after the model of those promulgated by bishop Wykeham. By these statutes, in conformity with the charter, the society was made to consist of a warden and twenty fellows, of whom sixteen were to study the civil and canon laws, and the remainder philosophy, and the arts, and divinity. Chaplains, clerks, and choristers were likewise added for the service of the chapel. Numerous benefactors have enriched this college at different periods, by whose conjunct donations the society has been enabled to augment the number of its members to a warden, forty fellows, two chaplains, and six clerks and choristers. The warden is elected in the same manner as the warden of Merton college. The archbishop of Canterbury is visitor.

The buildings of this college constitute two large quadrangles, one of which is entered from High-street, and the other from Radcliffe-square. The former was erected by the founder, and though in some parts modernized, still preserves

erves many features of the original style of its architecture. Two niches over the principal entrance contain large and well-sculptured statues of king Edward VI. and of Chichele. The latter quadrangle is comparatively of modern erection, and measures, within the court, 172 feet in length, and 155 in breadth. On the west are the grand entrance and the cloister; on the east the common room and other apartments, with two handsome towers; on the south the chapel and hall; and on the north the library. "This quadrangle," says Chalmers, "especially when viewed from the west entrance, presents one of the most attractive scenes of which Oxford can boast. The general style is the mixed Gothic." The library, which was begun in 1716, and only completed in 1756, owes its erection to the munificence of colonel Codrington, who left 10,000*l.* for that purpose, besides bequeathing to the society a collection of books, then valued at upwards of 6000*l.* The principal room is probably the largest so appropriated in the kingdom, being 198 feet in length, and 32½ in breadth, exclusive of a grand central recess, in the area of which is fixed a statue of the colonel. Dr. Young, author of the *Night Thoughts*, laid the foundation stone of this structure, which was designed by Hawksmoor, and chiefly executed under his direction.

Magdalen College was founded by William of Waynflete, bishop of Winchester, under the authority of a licence, dated July 18, 1457, for a president, forty fellows, thirty scholars called *demies*, a divinity lecturer, a school-master, an usher, four chaplains, an organist, eight clerks, and sixteen choristers. The fellows were directed to study divinity, medicine, and the canon law, and the demies to be "conversant in grammar, logic, sophistry, and that species of music called plain song, or chaunting." Among the chief benefactors of this institution were sir John Falstolf, who appointed the founder one of his executors, William, earl of Arundel, Ralph Freman, and John Norris, LL.D. by whose, and other donations, added to the endowments of Waynflete, the college became so opulent, that its annual revenues were estimated, in 1535, at 1076*l.* 5*s.* 2*d.* The members of this society still remain the same in number as at the time of foundation, with the addition only of gentlemen commoners, for no commoners are admitted. The bishop of Winchester is visitor.

The buildings of this college, as designed by the founder, compose two quadrangular courts, one of small, and another of large dimensions. The entrance to the first is through a modern portal of the Doric order, which appears very inappropriate, and very badly accords with the rest of the structure. This court contains the president's lodgings on the left, and in front is the entrance door-way to the chapel. This door-way is a very curious and beautiful specimen of architecture. In niches over it are small statues of Waynflete, Henry VI., St. John the Baptist, and St. Mary Magdalen, standing in canopies of exquisite workmanship. The large quadrangle remains nearly in the same state in which the founder left it, the south cloister being the only portion of the buildings that has been added since his death. Here are the chapel, hall, and library, a part of the president's lodgings, and chambers for the fellows and demies. The chapel, a most elegant structure, contains numerous monuments of persons connected with the college, and has its windows highly ornamented with painted glass. Round the whole interior of this court is ranged a series of large hieroglyphic figures, which have afforded matter of much enquiry among the Oxford topographers.

Besides the two courts above-mentioned there are a tower, and several other ranges of buildings belonging to Magdalen college, which have been erected at different periods, and

were not included in Waynflete's design. The tower is a structure of very fine proportion, and is supposed to have been designed by the celebrated Wolfey, while he was burfars of this college. It was commenced in 1492, and finished in 1498. A few years afterwards the chaplain's court was built; and some further rooms, towards the east, were added in 1635. At the beginning of the last century, a plan was proposed, and agreed to, for the building of a new quadrangle, but only one side of it has yet been finished. By this plan, three sides of the old quadrangle were to have been demolished, leaving only the hall, chapel, and south cloister.

Magdalen college being bound by its statutes to entertain the kings of England and their sons when at Oxford, the hall has frequently been the scene of royal and princely festivity. Edward IV., and Richard III., were both entertained here by the founder. In 1496, prince Arthur paid a visit to this college, and in 1605 James I. held his court within its walls, upon which occasion Henry, prince of Wales, was admitted a member of the society. Oliver Cromwell, Fairfax, and other principal officers of the parliamentary army, also had a sumptuous dinner provided for them here in 1649, and afterwards played at bowls in the college green, which, with the grove and water walk, form pleasure-grounds of great extent and beauty.

Brazen-Nose College.—This noble institution was founded by William Smyth, bishop of Lincoln, in concert with his friend sir Richard Sutton. The buildings were began about the year 1509, and shortly after the society was formed and accommodated in some of the ancient premises, which occupied the site of the present college, and most probably in the tenement called Brazen-Nose hall, whence the new foundation derived its name. By the charter of incorporation, which is dated 15th of January, 1511-12, this society was to consist of a principal and sixty scholars; but in 1621, a revision of the statutes having been made by the surviving founder, sir Robert Sutton, the members were limited to a principal and twelve fellows. They were soon, however, augmented by the munificence of succeeding benefactors, some of whom added fellowships, others scholarships and exhibitions, others lectureships in philosophy, in humanity, Hebrew, Greek, and mathematics. These last were founded by sir John Port, John Barneston, D.D., Richard Harper, a judge of the common pleas, and Thomas Weston, rector of Criffelton, near Chester. The other contributors are too numerous to be mentioned; so that we shall only observe, that by their conjunct donations, the society now consists of a principal, twenty fellows, thirty-two scholars, and fifteen exhibitioners, besides a great number of independent members. The bishop of Lincoln is visitor.

The buildings of this college are arranged round a large quadrangle and a smaller court to the south, with the exception of the residence of the principal, and lodgings for seven students, which are detached. The large quadrangle contains the hall and chambers for the society; and has suffered little alteration since it was originally built, except the addition of a continued attic. The front is an extensive range, forming the west side of Radcliffe-square, with a square tower in the centre decorated with architectural ornaments. The small court is occupied by the library and chapel, and was erected in the seventeenth century, from plans, as some assert, by sir Christopher Wren, while a very young man at college. The architecture is of the mixed kind; arched windows and battlements are here opposed by Grecian pilasters and capitals.

Corpus Christi College was founded and endowed by Richard Fox, bishop of Winchester. This prelate had de-

signed and partly executed a collegiate establishment for monks and secular scholars, to be subordinate to the priory of St. Swithin, in Winchester, but was induced to alter his plan, by the advice of Hugh Oldham, bishop of Exeter, and to found a college for the study of divinity, philosophy, and literature. He accordingly obtained a charter to that effect, dated March, 1516, and shortly after drew up a body of statutes, declaring the society to consist of a president, twenty fellows, twenty scholars, two clerks and two choristers. He likewise appointed two lectures for Greek and Latin, a measure which soon raised the reputation of the college to the highest pitch, as the founder conferred those offices on men of established fame and acknowledged erudition. The benefactors of this college are not so numerous as those of some other colleges, but the donations were in general liberal, and the ample provision of the founder rendered additional contributions the less requisite. Bishop Oldham above-mentioned gave 6000 marks, besides some estates in land, and Dr. Turner 6000*l.* The members of the college are the same as those prescribed by the charter, with the addition only of four exhibitioners and six gentlemen commoners. The bishop of Winchester is visitor.

Of the buildings of this college, the spacious quadrangle alone, with the chapel, hall, and library, was built by bishop Fox. This court is entered by a gateway under a lofty square tower in the centre of the principal front. On the east side is the hall, and on the south the library, which last is decorated with a statue of the founder in his pontifical robes. The rooms to the east of the quadrangle were first built in 1667, and re-erected in 1737, for the residence of the six gentlemen commoners. The fine building which looks into Christchurch walks owed its construction to Dr. Turner, and is appropriated for the reception of students. The library is enriched with an invaluable set of Aldine classics, and with numerous curious MSS. and rare works in a state of excellent preservation. The Aldine classics were collected by the founder.

Christchurch College is indebted for its origin to the munificence of the celebrated cardinal Wolsey, who has been justly styled the Mæcenæ of his age. This prelate began the great work in question in the year 1524, upon a scale far surpassing the design of any former or succeeding founder. By the original charter, which he procured from king Henry VIII., his projected establishment was made to consist of one hundred and sixty persons, who were to apply themselves to the study of the sciences at large, as well as to polite literature. For the support of this society he settled upon it a clear annual revenue of 2000*l.* and commenced the present structure for the accommodation of its members, under the designation of "Cardinal College." Before he had completed his plans, however, he was hurled from the lofty pinnacle of power to which he had risen, and plunged into irretrievable disgrace: but before his death he warmly recommended his college to the fostering regard of his monarch. Accordingly Henry, after the first effusions of his resentment had subsided, yielded to the entreaties of the society in 1532, and became its patron. But in order to preclude Wolsey from all nominal participation in the merit of the undertaking, he granted the college a new charter of foundation, directed that its members should consist of a dean and twelve canons, and that it should be called "King Henry VIIIth's College in Oxford." This arrangement, however, only continued for twelve or thirteen years, at the end of which period the society yielded up their charter and possessions to the king, who converted the college into a cathedral church, by translating the episcopal see hither from Oseney. The institution now

became an appendage to the cathedral, and received the name of "The Cathedral Church of Christ in Oxford, of king Henry the VIIIth's foundation." At the same time the society was declared to consist of a bishop, with his archdeacon, a dean, and eight canons, who had all the college estates made over to them on condition of their maintaining three professors of divinity, Hebrew, and Greek, one hundred students in theology, arts, or philosophy, eight chaplains, and a numerous choir. The king is visitor of this college.

The benefactors to Christ-church are few, and all of them appeared at a period long subsequent to its foundation. Among the principal of them were the celebrated Dr. Busby of Westminster, who bequeathed a sum of money for a catechetical lecture; bishop Fell, who contributed ten exhibitions of 10*l.* per annum each; and Dr. Lee, physician to George II. who left 20,000*l.* for the purpose of erecting an anatomical theatre.

The buildings of this magnificent college occupy the area of the ancient priory of St. Frideswide, and have undergone as many revolutions as the society itself. They are chiefly arranged round four courts, two of which are very spacious. The great west quadrangle is particularly interesting, as being the work of Wolsey, and indicates, that if that illustrious founder had survived till he had been enabled to complete the design he appears to have formed, his college would have exceeded in magnificence every other in Europe. This quadrangle is entered by the gateway of the principal front, which extends 382 feet, and is adorned in the centre by a stately tower begun by Wolsey, but only completed in 1681, by sir Christopher Wren. All the buildings here are beautifully proportioned, and are faced with a fine terrace, as well as surmounted by a handsome stone balustrade. The hall and kitchen are on the south, and on the east and west sides are splendid ranges of lodgings for the dean and canons. The hall occupies more than one-half of an entire range, and was begun and finished under the direction of the founder. This room is 115 feet in length, 40 in breadth, and 50 in height. The roof is of oak, carved in an elaborate style. "The windows are intersected Gothic, and one in a recess on the southern side is among the finest specimens of that mode of architectural disposal." The side walls are of panelled wainscot, and display an extensive collection of portraits, among which are an original half length of cardinal Wolsey, a whole length of king Henry VIII. another of queen Elizabeth, and a third of Dr. Busby, with a pupil in attendance.

The second great quadrangle of this college, termed Peck-water court, was erected at the commencement of the last century, and contains the library on its southern side. This edifice is 141 feet long in front, and is adorned with massive pillars in the Corinthian style. Each of the other sides is appropriated as lodgings for students. Their elevation is three stories, the lower of which is rustic, and "supports a range of architecture of the Ionic order," finished by an entablature and balustrade of stone. In the library, which is rich in MSS. prints, and coins, is likewise a very noble collection of paintings, bequeathed to the college by brigadier-general Guise in 1765. Most of these paintings are by the old masters, and must have been collected at an immense expence.

The two smaller courts are denominated Canterbury square and Chaplain's court. Of these the first only deserves to be noticed, being now the principal entrance into the college. It stands on the site of Canterbury hall, which was founded in the fourteenth century by archbishop Islip, as a place for the study of the canon and civil law. The

design

design of this court was furnished by James Wyatt, esq. architect, and the whole carried into execution under his direction. It was completed in 1783, chiefly through the munificence of Richard Robinson, baron Rotheby, late lord primate of Ireland.

The cathedral of Christchurch, to which the college is appended, will be noticed in the sequel under the head of churches.

Trinity College was founded by sir Thomas Pope, in the reign of Philip and Mary, from whom he obtained a royal licence and charter, dated the 8th and 28th March 1554. The society was then made to consist of a president, a priest, twelve fellows, and eight scholars, but the latter were soon increased to twelve. These he placed in the tenements called Durham college, which he purchased and repaired for their accommodation. In 1556 he drew up a body of statutes for their regulation, under the auspices of the celebrated cardinal Pole, to whom it is supposed he was indebted for many useful hints. The same statutes are still in force, with some slight alterations made by the first president, with the consent of the founder, after the re-establishment of the Protestant worship, on the accession of queen Elizabeth.

The endowment of this institution by sir Thomas was only limited by the extent of his means, which were happily ample. In May 1556 he gave the society one hundred pounds; and before the close of that year made over to them no fewer than thirty-five manors and thirteen advowsons, besides impropriations and pensions. So liberal, indeed, was his donation, that with the exception of the contributors towards the new buildings few persons have deemed it requisite to become benefactors to this college, so that the society remains nearly in the same state as when originally founded, with the addition only of gentlemen commoners and commoners. The bishop of Winchester is visitor.

Architecturally considered, this college consists of two courts. The first contains the chapel, the hall, the president's lodgings, the library, and some apartments for the fellows and scholars; and the latter is wholly occupied by lodgings for the reception of students. The chapel was built chiefly at the expence of Dr. Bathurst. As is generally supposed after a design by dean Aldrich, corrected and improved by sir Christopher Wren. The interior is highly decorated. In a recess at the upper end of this chapel is a monument in honour of sir Thomas Pope, and of his third lady, with their whole length figures sculptured in alabaster.

St. John's College.—All the colleges hitherto noticed have owed their origin to the munificence of distinguished statesmen, or prelates; but we now come to one which was founded and endowed by an individual, whose fortune was gained by industrious exertions in the mercantile world. This was sir Thomas White, a citizen and merchant of London, and one of the most liberal and benevolent characters of his age. The spot selected for the new foundation was the site of St. Bernard's college, the buildings of which, indeed, still form a small portion of the present college. Here sir Thomas fixed his society in 1557, shortly after he had obtained a licence and charter for its institution, and in the same year drew up a body of statutes, declaring that it should consist of a president, fifty fellows and scholars, three chaplains, three clerks, and six choristers; but the twelve last-mentioned members were soon discontinued, the funds being found inadequate to their proper support. A suitable choir, however, has since been founded by sir William Paddy, one of the numerous benefactors who have contributed to enrich the society at different periods. Among these the chief were archbishops Laud and Juxon,

and Dr. William Holmes and his lady. All the fellows of this college, except six of the founder's kindred, and two from Coventry, two from Bristol, two from Reading, and one from Tunbridge schools, are elected from Merchant Tailor's school in London, sir Thomas having been a member of that respectable corporation. The bishop of Winchester is visitor.

The buildings of St. John's college, as they at present stand, have been erected at various periods. They are arranged chiefly in two quadrangles, one of which still retains a part of the tenements which composed Durham college. In this division are the hall and chapel, the president's lodgings and chambers for the fellows and scholars. The principal entrance is under a square tower adorned with a statue of St. Bernard placed in a richly canopied niche. On the east side is a passage leading into the second quadrangle, which contains the library, and was erected at the sole expence of archbishop Laud, from a design by Inigo Jones. In the centre, both on the east and west sides, is a gateway of the Doric order, surmounted by a semicircular pediment of the Ionic and Corinthian, and having a statue on either side between the columns. These represent king Charles I. and his queen, and "were designed and cast in brass by Fanelli of Florence." The apartments, in the same range with the gateways, are built over cloisters, supported by eight round arches, and adorned with busts of the cardinal and Christian virtues over each pillar. The library here is enriched with a valuable collection of books and MSS. and a variety of antiquarian curiosities.

Jesus College owes its foundation to Hugh ap Rice or Price D.D. first prebendary of Rochester and treasurer of St. David's. This benevolent character, observing that his countrymen, the Welsh, were scarcely ever noticed in collegiate endowments, resolved to found a college peculiarly for their benefit, and with this view prevailed on queen Elizabeth to institute the present establishment by charter dated June 27, 1571. This deed prescribed that the college should be erected by the name of "Jesus College, within the city and university of Oxford, of queen Elizabeth's foundation," and declared the society to consist of a principal, eight fellows, and eight scholars. It further permitted Dr. Price to settle upon them an annual revenue of 160*l.*, to which he added a donation of 1500*l.* to assist in erecting the buildings, besides a small sum which he bequeathed for the same purpose at his death. The queen, though nominally foundress, bestowed little patronage and still less property on her college, a circumstance not a little remarkable, as we believe this to have been the first college in Oxford which could boast of deriving its origin from a Protestant benefactor. Hence, when Dr. Price died the funds of the society were so much exhausted as to stop for a time the progress of the buildings. But private munificence soon after supplied the want of regal bounty. The buildings were gradually completed, and many extensive benefactions quickly added stability to the hitherto limited finances of the institution. Sir Enbule Thelwall, besides liberal donations, procured for the society a new charter, dated June 1, 1622. Dr. Williams founded a logic lecture, and sir Thomas Canon a catechetical lecture. Among the other more extensive contributors were Henry Westphaling, bishop of Hereford; Henry Rowlands, bishop of Bangor; king Charles I.; Francis Mansell, D.D.; sir Leoline Jenkins; and Edward Merrick M.A., treasurer of St. David's; some of whom added new fellowships and scholarships. These additional revenues rendered new charters necessary at different periods. The last was granted by George II. January 10, 1729, and under it the society now consists of a principal, nineteen fellows, and eighteen scholars,

lars, besides a number of exhibitors, &c. The earl of Pembroke is visitor.

The buildings of Jesus college form two quadrangles, the first of which measures 90 feet by 70, and the second 100 feet by 90. The former, entered from the street, contains the chapel on the north and the hall on the east sides. The other sides are occupied by apartments of three stories high. The front, in the street, was rebuilt in 1756, and is a heavy erection, destitute alike of interest and beauty. The second, or inner quadrangle, was begun in 1640, under the management of Dr. Mansell, then principal; but the disturbances arising from the rebellion prevented its completion till the year 1676, when it was finished by sir Leoline Jenkins, at his own expence. The library, on the west side of this quadrangle, contains a good collection of books and some curiosities, among which are an immense silver bowl, weighing 278 ounces, and capable of holding above ten gallons; a metal watch given by Charles I.; and a huge stirrup, said to have been pressed by the foot of queen Elizabeth. The chapel, built in 1621, is divided into three parts by two screens. The roof is finished in compartments, and is very richly decorated.

Wadham College was founded by Nicholas Wadham, esq. and his wife Dorothy, daughter of sir William Petre, an eminent benefactor to several colleges in this university. The execution of the undertaking, however, wholly devolved on the latter, as Mr. Wadham himself died before the plan he had proposed could be carried into effect. Her first step was to purchase the site of the ancient priory of Austin friars, once a place of great distinction in the university, which she accomplished in 1610, and on the 31st of July, in the same year, laid the first stone of the present college. A royal licence was obtained in 1611, and in 1612 the statutes promulgated by the founders received the sanction of an act of parliament. By these statutes, which still continue in force, except as to the subject of marriage, the college was made to consist of a warden, fifteen fellows, fifteen scholars, two chaplains, and two clerks. To these, however, several exhibitions have been added by successive benefactors, among whom the late Dr. John Wills, who died in 1806, deservedly holds the first rank. This gentleman bequeathed 400*l.* a-year to the wardenhip; 1000*l.* to improve the warden's lodgings; two exhibitions of 100*l.* *per annum* each to two fellows, students in law or medicine; two exhibitions of 20*l.* to scholars in the same faculties; 20*l.* a-year for a divinity lecturer; an annual exhibition of 75*l.* and another of 100*l.* to two superannuated fellows; 11*l.* 10*s.* to a preacher; and 6*l.* a-year for the purchase of books to be given as a premium to the best reader in the chapel. He further nominated the society his residuary legatee.

The buildings are entirely comprised in one very spacious quadrangle, about one hundred and thirty feet square; the whole of which, with the exception of a building of three stories on the south of the front, were erected by the founders, at the expence of 10,816*l.* 7*s.* 8*d.* This college is entered by a gateway, under a central tower, and has on its eastern side the hall and chapel, and on the other three, the warden's lodgings, and apartments for the fellows, scholars, and students. In the middle of the eastern side is a portico in four compartments, adorned with statues in canopied niches of the founder and founders, and of king James I., whose arms, sculptured in stone, are placed in the highest compartment. The bishop of Bath and Wells is visitor.

Pembroke College owes its foundation to the joint munificence of Thomas Tefdale and Richard Wightwick; for though in the charter, which is dated 1624, king James is denominated founder, and the earl of Pembroke, the chan-

cellor of the university, godfather, yet they in fact contributed little or nothing towards its establishment, further than what their patronage may be supposed to have accomplished. According to the statutes drawn up, agreeably to the charter, the society was made to consist of a master, ten fellows, and the same number of scholars; but the fellows have since been increased to fourteen, and the scholars and exhibitors to twenty-one, by the liberality of different benefactors, among whom the most eminent were lord Ossulton, grandson to the founder Tefdale, and George Morley, bishop of Winchester. The chancellor of the university is visitor.

Pembroke college now forms two small courts, which are built on the ancient site of Broadgate's hall, some portion of which is still standing, and constitutes the hall of the present college. The principal court is uniform in its architecture, and possesses the merit of simplicity. It was chiefly erected at different periods during the seventeenth century, partly with the money of the founders, and partly by the aid of subsequent contributions. The front, which was only completed in 1694, is an unadorned elevation, with a low tower over the entrance in the centre. The chapel is a small, but elegant edifice of the Ionic order, and is richly ornamented within.

Worcester College was founded in 1714, under the will of sir Thomas Cookes of Bentley Paucefort, in Worcestershire, who died in 1702, and bequeathed 10,000*l.* to be applied either in establishing a new college, or in the endowment of additional fellowships and scholarships in some previous establishment. The trustees at first hesitating which of the above plans to adopt, the money accumulated to 15,000*l.* before they came to the resolution of founding the present institution. This, however, they at length determined on, and a charter of incorporation was obtained in 1714 for a college, to be called "The Provost, Fellows, and Scholars of Worcester College, in the University of Oxford." A body of statutes were framed about the same time, and the society settled in the ancient tenements of Gloucester hall, some part of which still remains. Several liberal benefactors soon after added considerable donations. Of these, the principal were Dr. James Fynney, George Clarke, D. C. L., and Mrs. Sarah Eaton, the last of whom endowed seven fellowships and five scholarships for the sons of clergymen only. Hence the society now consists of a provost, twenty-one fellows, and fifteen scholars. The visitors are the bishop of Oxford and the vice-chancellor of the university. A preference is given in the choice of students, on the original foundation, to persons educated in the founder's schools of Bromsgrove and Feckenham, and to his own kindred.

The situation of Worcester college is on the western side of the city, on an eminence near the bank of the river Isis. The buildings form a court, the south side of which is still occupied by a range of old apartments, but its other divisions are all of modern erection, and comprise a chapel, a hall, a library, and lodgings for the accommodation of members and students. The architecture of these portions is grand and imposing, though simple and devoid of ornament. The library, however, is supported by a spacious cloister in the front towards the court, and is particularly remarkable for a valuable collection of architectural books and manuscripts.

Hertford College, the last we have to notice, was the ancient Hart hall, which was founded by William Stapledon, bishop of Exeter, and continued attached to Exeter college till the year 1740, when it was elevated to the rank of an independent college by Dr. Newton, who bestowed upon it his whole property. This, however, has proved insufficient for its intended purposes, and as few benefactors have ap-
peared

peared in aid, the institution is now much declined. Since 1805 it has had no principal, and at present there is only one fellow, though by the statutes the society was made to consist of a principal, four senior fellows, and eight junior fellows or assistants. The chancellor of the university is visitor.

According to the design of Dr. Newton, the buildings of this college were to have formed one spacious quadrangle, containing a chapel, hall, and library, lodgings for the principal, and apartments for the society. Of this plan only a part has hitherto been carried into execution, and that by the founder himself, no additions having been made since his death. The portions of Hart-hall still remaining are, the refectory, built in the reign of queen Elizabeth, the old principal's lodgings, with the kitchen and chambers over them, and the gatehouse and library.

Before particularizing the *halls*, it may be proper to observe, that previous to the foundation of colleges all the university students lodged in tenements rented by citizens of Oxford, and that when a tenement was once so appropriated, the proprietor could never again recover it for other purposes, nor sell or demise it, without binding the purchaser to leave it open to the use of the university, if required. When an advance of rent was demanded, the reasonableness of the demand was determined by the arbitration of two masters on the one part, and two citizens on the other, who were sworn to do justice between the parties. Such places of education are of considerable antiquity, and were, probably, as we have already hinted, at first appended to monastic institutions. In the time of Edward I. they are said to have exceeded three hundred in number, but after the endowment of colleges began, they rapidly sunk into neglect, and now only five remain, one of which is destitute of students. Each hall is governed by a principal, under the guidance of statutes originally drawn up by the principal of the university, and alterable at his pleasure. This officer is officially visitor of all the halls, and has the power of nominating the whole of the principals, except the principal of St. Edmund's hall, who is elected by the provost and fellows of Queen's college. The students in these halls have equal university privileges with those belonging to the colleges, and are subject to the same regulations with respect to discipline, course of studies, tuition, length of residence, examinations, dress, &c.

St. Alban's Hall, the most ancient of those now remaining, is situated on the east side of Merton college. This hall derived its name from Robert de Sancto Albano, a burgess of Oxford, in the reign of king John. In the time of Henry VI. it was united to Nunne hall, which stood west from it, but its principal's were appointed by Merton college. Henry VIII. granted both halls conjoined, in the name of Alban hall, to his physician, from whom it passed to different proprietors, and is now the property of the warden and fellows of Merton college. The buildings of this hall form a quadrangle, plain in its architecture, but commodious in respect to internal arrangements.

Edmund Hall is traditionally so called from St. Edmund, archbishop of Canterbury, in the reign of Henry III. At the dissolution it belonged to Oseney priory, and soon after that event came into the possession of Queen's college, and was renewed as a place of study under the auspices of that institution, to which it still continues attached. Several extensive additions to the old buildings of this hall have been made during the two last centuries, chiefly by the liberality of its own members, and those of Queen's college. The library, begun in 1680, has been enriched by several valuable collections of books and MSS. This portion of the build-

ings, as well as the chapel, was erected by Stephen Penton, B.D. principal, and chiefly at his own expence.

St. Mary's Hall was anciently conveyed to the rectors of St. Mary's church for a parsonage house, and remained in their possession till the year 1325, when Edward II. gave it, with the advowson of the church, to the society of Oriel college, who converted it into an academical hall in 1333, under its present appellation. The buildings are arranged in the form of a quadrangle, containing lodgings for the principal on the north, a hall and chapel on the south, and apartments for the students on the west and east, all of which have either been rebuilt, or much improved within the last century.

New Inn Hall is now entirely gone to decay, the only part of its buildings now remaining being a house for the principal, who is only nominally such, there having been no students at this hall for many years. It was, at one time, however, very famous for students of the civil and canon law, and produced many eminent characters in that faculty. In 1642 it was occupied as a mint by king Charles I., who here melted down the plate presented to him by the university.

St. Mary Magdalen Hall was founded as a grammar school in 1480, by William Waynflete, founder of Magdalen college, to which it immediately adjoins. It was first called Grammar hall, but received the name of Magdalen hall upon being enlarged, and placed upon the same footing with respect to academical privileges as the other halls. This foundation appears to have been generally in a very flourishing condition, and at one time is said to have had nearly three hundred members, but it is difficult to conceive how so many persons could be accommodated within its walls. Dr. William Lucy, and some other benefactors, have established a number of exhibitions in this hall for the benefit and encouragement of the students. A part of the buildings has likewise been erected by the munificence of private individuals, among whom Dr. John Wilkinfon, principal from 1605 to 1643, and his successor Henry Wilkinfon, are deservedly the most noted. The latter built the library, and procured for it a good collection of books, which have been since increased by various contributions.

Public Institutions connected with the University.—Besides the colleges and halls there are several public buildings and establishments, which either owe their origin to the university, or are placed under the management of its officers. The principal of these are the schools; the Bodleian library; the theatre; the Clarendon printing-house; the Radcliffe library; the Ashmolean museum; the observatory; the physic garden; and St. Mary's, or the University church, which last will be noticed under the head of churches.

The first *Public Schools* were erected about the commencement of the fifteenth century, by Thomas Hokenorton, abbot of Oseney, and consisted of ten apartments, allotted to different branches of education. To these were added the divinity school in the year 1427, the erection of which was chiefly effected by the liberality of Humphry, duke of Gloucester, usually styled the Good. This last is still standing, and is a curious specimen of architecture. All the others, however, were demolished in the beginning of the seventeenth century, when the present schools were erected, which, with part of the Bodleian library, form a quadrangle of about one hundred and seventy feet in length. Over the gateway is a lofty tower, fantastically arranged in compartments, exhibiting an imitation of the five orders of classic architecture. (See Britton's Architectural Antiquities, vol. iii.) The whole quadrangle is now three stories high, two of which are appropriated as schools, while the third and highest is occupied

occupied as a picture gallery, and contains a numerous and splendid collection of the portraits of founders, benefactors, and other eminent persons connected with the university. The schools are governed by three masters, who cannot hold their office more than two years in succession. The public professors read lectures here in the different sciences, and here also the scholars of the university are obliged, by statute, to perform the exercises required of them, before they can obtain their degrees. In the moral philosophy lecture room is preserved a collection of statues, marbles, and busts, the gift of the countess dowager of Pomfret; and in an apartment on the north side of the schools, are ranged the Arundelian marbles, together with numerous other monuments of Grecian antiquity, collected by Selden, Wheeler, and others, and presented or bequeathed to the university.

The *Bodleian* or *Public Library* was founded by sir Thomas Bodley at the close of the sixteenth century, on the remains of that which was established by the duke of Gloucester above-mentioned, but had been divested of all its valuable books and illuminated MSS. by the commissioners of Edward VI. This library occupies three extensive rooms, disposed in the form of the letter H, and probably contains the most valuable collection of books and MSS. in Europe, as the donations in aid of sir Thomas's contribution have been splendid and liberal beyond precedent. Among those who had added whole libraries to the original collection, are the earl of Pembroke, Mr. Selden, archbishop Laud, sir Thomas Roe, sir Kenelm Digby, general Fairfax, Dr. Marshall, Dr. Barlow, Dr. Rawlinson, Mr. St. Amand, Dr. Tanner, Mr. Willis, T. Hearne, Mr. Godwin and Mr. Gough. The last contributed all his topographical collections, books, prints, copper plates, and drawings.

The statutes by which this library is governed, were drawn up by sir Thomas Bodley, who, besides his books, left an estate to the university for the provision of suitable salaries to its officers, and for the repair of the buildings. These statutes are preserved in the founder's own hand writing, in the archives of the library, and contain, among other clauses, one appointing the vice-chancellor, proctors, and the regius professors of divinity, law, medicine, Hebrew and Greek, visitors or curators. The Rev. Bulkley Bandinell, M.A. is librarian.

The *Theatre*, or *Selden Theatre*, in which are held all the acts called the *Encœnia*, and *Comitia*, also lord Crewe's annual commemoration of benefactors, was built at the sole charge of archbishop Selden, who, besides, gave the sum of 2000*l.* as a fund for repairs. The architect was sir Christopher Wren, who, in the plan and construction of this edifice, gave a happy presage of those talents which he afterwards displayed in the metropolis. By an ingenious disposition of its parts he has contrived to render it capable of holding nearly four thousand persons, though its dimensions seem altogether inadequate for that purpose. The roof is eighty feet by seventy, and rests entirely on the side walls, without any central support. The exterior elevation on the side opposite to the divinity school is adorned with columns of the Corinthian order, and statues, in niches, of the founder, and the duke of Ormond.

The *Clarendon Printing-house* was erected in 1711, with the profits arising from the sale of lord Clarendon's History of the Rebellion, the copyright of which was presented to the university by his lordship's son. It is a massive structure, two stories high, adorned in front with a portico of the Doric order, and has a statue of the noble author over the southern entrance. The business of this house is superintended by persons termed delegates of the press, who are appointed by the vice-chancellor and proctors.

The *Radcliffe Library*, which is certainly one of the most imposing architectural ornaments of the university, was founded by Dr. Radcliffe, an eminent physician in the reigns of king William and queen Anne, he having bequeathed 40,000*l.* for its erection, 150*l.* per annum for a librarian, and 100*l.* per annum for the purchase of books. The building itself was designed and executed by Gibbs, between the years 1737 and 1749; and some of the first artists of the age were employed on its interior embellishments. Exteriously, a rustic basement, in the form of a double octagon, supports a cylindrical superstructure, adorned with three-quarter Corinthian columns, ranged in couplets, between which are windows and niches alternately. A balustrade, finished with vases on the piers perpendicular to the columns, surmounts the entablature, and the whole elevation is terminated by a fine cupola sixty feet high, which renders this building a striking feature in every distant view of the city. The contributions to this library are few, compared to those to the Bodleian, which seems almost to have wholly engrossed the munificence of the learned.

The *Ashmolean Museum* owes its foundation to Elias Ashmole, author of the History of the Garter, who offered to bestow on the university all the extensive collections in natural history which had been bequeathed to him by the two Tradescants, the celebrated naturalists and physic gardeners at South Lambeth, (see MUSEUM,) and to add to these his own coins, medals, MSS. and books, provided the university would defray the expence of erecting a proper building for their reception. This offer was accordingly accepted, and the present edifice raised, under the direction of sir Christopher Wren. The contributors to this museum have been numerous. The chief of them were Dr. Plot, Mr. Llwyd, Mr. Borlase, and Mr. Reinhold Foster. The contribution of this last consists chiefly of curious articles from the South Sea islands. This building likewise contains the books of Dr. Lister, and the MSS. of Dugdale, Aubrey, and Wood.

The *Astronomical Observatory* was built at the expence of 30,000*l.* defrayed by the trustees of Dr. Radcliffe. It is situated at the extreme end of the north suburb, on a very appropriate site with attached grounds, which were presented to the university by the duke of Marlborough. The central elevation of this edifice is upwards of 100 feet, and its third story consists of an octangular tower, with sculptural representations of the eight winds on the entablature, and a ponderous earth-coloured globe at the top. The whole structure comprises a dwelling-house for the observer, apartments for observation, for an assistant observer, and for lectures, and is supplied with a valuable set of astronomical instruments, besides a library. See OBSERVATORY.

The *Physic Garden*, comprising about five acres of ground, is situated opposite to Magdalen college, on the south, and is encompassed by a lofty wall, with a handsome gateway, which was designed by the celebrated Inigo Jones. Over the arch of this gateway is a bust of the founder, Henry Danvers, earl of Danby, and on the right and left are statues of Charles I. and II. The garden is arranged in four quarters, and is provided with suitable green-houses, and a hot-house for the reception of the more tender and exotic plants. The chief contributor to this garden was Dr. Sherard, who in 1728 left three thousand pounds for the endowment of a professorship of botany; and in 1793 a Regius professor in that science was likewise appointed by his present majesty.

Government and Civil History of Oxford.—The corporation of this city, established both by charter and by prescription, is governed by a mayor, a high steward, recorder, four aldermen, eight assistants, two bailiffs, a town-clerk,

clerk, two chamberlains, and twenty-four common-counsellors. By grant from Henry I. the mayor, for the time being, acts in the buttry at the coronation feasts of the kings and queens of England; and hence, as well as from other causes, many of them have received the honour of knighthood. Oxford sends two members to the national senate, and has done so, according to Willis, in his *Notitia Parliamentaria*, since the first institution of a parliament in this island. The electors are the corporation and free-men, and the returning officers, the mayor and bailiffs.

Oxford is divided into four wards, under the immediate jurisdiction of the four aldermen; and these again, with the suburbs, are subdivided into fourteen parishes; St. Mary's, All-Saints, Carfax, or St. Martin's, St. Clements, St. Ebbs, St. Giles's, the Holy Cross in Holywell, St. John's, St. Mary Magdalen's, St. Michael's, St. Peter's in the East, St. Peter's in the Bailey, St. Aldgate's or St. Old's, and St. Thomas's. The whole of these contain, according to the parliamentary returns of 1811, 2064 houses, and 12,931 inhabitants, of whom 1015 persons belonged to the colleges.

Public Buildings belonging to the City.—Besides the colleges and the public structures already mentioned as peculiarly connected with the university, there are several others erected for religious and municipal purposes, which cannot properly be passed over unnoticed. Of the first description are the cathedral, the parish churches, and the chapels of dissenters; and under the latter we shall include the town and county-hall, the Radcliffe infirmary, the House of Industry, the town and county gaol, the city Bridewell, the schools and alms-houses, and the range of buildings for the market.

The *Cathedral Church* is situated to the east of the grand quadrangle of Christchurch college. It was originally the church of St. Frideswide's monastery, on the site of which the college is erected. This edifice is referred by King, in his *Munimenta Antiqua*, to the era of the Saxons; but Dugdale, Tanner, and Willis, date its foundation in the time of Henry I.; and as their opinions are generally more rational and probable than those entertained by Mr. King, we are fully disposed to coincide with them on this point. In its architecture this church presents the styles and examples of different ages, from the time of the original building, up to the commencement of the 16th century. The church is built in the shape of a cross, and measures one hundred and fifty-four feet in length. In the centre rises a tower, with a spire to the height of one hundred and forty-four feet. Some of the windows contain fine specimens of painted glass, and in the north aisle is a monument attributed to St. Frideswide.

St. Mary's Church, or, as it is sometimes called, the University Church, is a beautiful structure, in the pointed style of the reign of Henry VII. The south porch, with twisted columns, is however a deformed and tasteless appendage. The church is situated on the north side of High-street, and consists of a spacious chancel, and three aisles, with a square tower and spire, one hundred and eighty feet high. The tower is supported by two graduated buttresses at each angle, and is finely ornamented with statues in niches, pinnacles, &c. In this church the public sermons of the university are preached on Sundays and holidays; and it is consequently fitted up in a manner proper for the reception of the several members of that distinguished corporation. The pulpit stands in the middle aisle, and at its western end is the chancellor's throne, which is elevated several steps above the other seats. Close to the throne are the seats of the proctors, and next to them, on either side, sit the doctors and heads of houses.

The church of *All-Saints* is situated in the same street.

with St. Mary's, but is a structure of a very different kind, being of comparatively modern erection, and in the style of sacred architecture, which sir Christopher Wren contributed to render popular. This edifice comprises a nave, a chancel, and two aisles, and its roof is supported entirely upon the side walls, there being no pillars within the church, though pilasters of the Corinthian order are frequent. The tower is surmounted by a turret, encircled by Corinthian pillars, whence rises a spire. Between the lower range of windows are pilasters of the same character, disposed in couplets. The architect of All-Saints was Dr. Aldrich, dean of Christchurch, who also designed the buildings of Peckwater-square.

St. Peter's in the East is an interesting edifice, of a very ancient date. It is commonly said to be the earliest stone church erected in this part of England. The precise date of its foundation, however, is uncertain, as the claims of St. Grymbald to be the founder, are at least as doubtful as the story of his professorship, under the patronage of king Alfred. This church was formerly the university church, and the vice-chancellor and heads of houses still attend divine service here in the afternoon of the Sundays during Lent. It has a nave, chancel, and two side aisles, with a tower at the west end. The chancel is a singular and curious specimen of architectural design; particularly in the ribs beneath the ceiling, and in two windows. Beneath the chancel is a crypt, supported by six circular pillars with square bases and capitals. Some of the latter are charged with very rude, but singular sculpture. See *Architectural Antiquities*, vol. iv.

St. John's Church, which is likewise the chapel to Merton college, is a rich specimen of the architecture of the 15th century, and in higher preservation than usually happens with the buildings of that age. Its members are a choir, a cross aisle, an anti-chapel, and a square tower, which rises from the centre of the cross aisle, and is elegantly adorned with panelling and pinnacles. The windows, both of the choir and cross aisle, are filled with painted glass: so is likewise the great east window, the masonry of which is exquisitely delicate. Near the altar of this church are the monuments of the distinguished benefactors to the university, sir Thomas Bodley and sir Henry Savile; and close to the door is a small mural tablet, commemorative of the celebrated Oxford historian, Anthony a' Wood.

Carfax, or *St. Martin's Church*, is composed of a nave, two narrow aisles, and a chancel, with a tower at the west end, which was reduced to its present height in the time of Edward III., on a complaint by the scholars that the townsmen frequently took possession of it "in time of combat," and annoyed them therefrom with stones and arrows, as from a castle.

St. Clement's Church is a small building of one aisle and a chancel, and a low tower at the west end. *St. Ebbs*, so called from Ebba, daughter of Ethelfrid, king of Northumbria, is likewise of small dimensions, containing a nave, north aisle, and chancel. *St. Giles's* was erected in the 12th century, as some say, on the site of an ancient British temple. This structure consists of a nave, chancel, and a north and south aisles, and has an embattled tower at the west end. *Holywell Church* is a small building, supposed to have been erected by Robert de Oigli, the founder of the castle. *St. Michael's Church*, originally belonging to the canons of St. Frideswide, is now a curacy incorporated into one collegiate church, with the college of Lincoln. The tower of this edifice is of great antiquity, but its other parts are of late erection. So likewise is the church of *St. Peter's in the Bailey*, which is a stone building, finished in 1740. *St. Aldgate's*, on the other hand, is very ancient, having been used as a cloister to receive persons training for the priory of St. Frideswide

and Abingdon-abbey. It is an irregular pile, erected at different periods. *St. Thomas's* is also of ancient date, having been founded in 1141 by the canons of Osenev, and dedicated first to St. Nicholas and afterwards to St. Thomas à Becket. This building consists only of one aisle and a chancel, with an embattled tower at the west end.

As dissenters from the established church are comparatively few in Oxford, meeting-houses are neither frequent nor spacious in extent. Indeed, almost the only regular sectarian chapels here are those belonging to the Roman Catholics, the Quakers, the Methodists, and the Baptists.

Among what have been termed the municipal public buildings in Oxford, the *Town and County Hall* may properly claim the precedence as the seat of the courts of justice, and the focus of the municipal authority. It is a spacious edifice of stone, having a pediment over the centre of the front, which exhibits a range of rustic work in its lower division. The expence of erecting it was chiefly defrayed by Thomas Rowney, esq. late high steward of the city.

The *Radcliffe Infirmary* is one of the public edifices conferred on Oxford by the munificence of Dr. Radcliffe: it having been built by his trustees with part of the funds remaining in their hands after the completion of the Radcliffe library. It is a stone building, well adapted for the reception of patients, and has extensive grounds attached, the donation of T. Rowney, esq. above mentioned. The charity is supported by voluntary subscriptions.

The *House of Industry* stands near the infirmary. It was built for the reception of the poor of eleven parishes, and is consequently a structure of considerable extent, but possesses no architectural features worthy of remark. The other principal charitable institutions in Oxford are, Boulter's and Stone's alms-houses, and four charity-schools, one of which, for fifty-four boys, is supported by the university.

The *Town and County Gaol* is a large edifice of stone, with separate lodgings, and yards of exercise for the debtors and felons. It occupies a part of the site of the old castle, built by Robert de Oigly, and displays much more lightness and architectural taste than is usual in structures of a similar description. It was designed and erected by D. Harris, esq. architect.

The *City Bridewell* is a modern building, substantial in its construction, and well arranged for the purposes to which it is appropriated. Before the erection of this edifice, in 1789, offenders, within the jurisdiction of the mayor, were placed in a prison over the north-gate, called Bocardo, where Cranmer, Ridley, and Latimer were confined, and whence they were led to the stake. In a small room, which forms the entrance to the Bridewell, is still preserved the door which is said to have led to the cell of these illustrious martyrs.

The *General Market-house* is a commodious range of building, erected under the authority of an act of parliament, and certainly constituting one of the greatest improvements effected during the last century. It is separated into three divisions, one appropriated to butchers, a second to the venders of poultry, bacon, &c., and a third to the sale of vegetables and fruits. Round the whole are ranges of shops under an arcade.

Monastic Antiquities of Oxford.—This city, as has been already hinted, contained no fewer than nineteen religious houses prior to the reformation, some of which were converted into collegiate establishments. The names of these monastic institutions were as follows: 1. St. Frideswide's priory; 2. St. George's college; 3. Osenev abbey; 4. Rowley abbey; 5. St. Bernard's college; 6. Canterbury college; 7. Durham college; 8. Gloucester-hall; 9. London college; 10. St. Mary's college; 11. St. Bartholomew's hos-

pital; 12. St. John's hospital; 13. Austin Friars; 14. Black Friars; 15. Grey Friars; 16. White Friars; 17. Crouched Friars; 18. Friars de Sacco; and 19. Trinity-house.

St. Frideswide's Priory is said to have been originally founded for nuns of noble birth, by Didanus, an earl of Oxford, about the year 727, and to have derived its name from Frideswide, his daughter, whom he appointed the first prioress. In 1111 it was made the seat of a society of regular Augustine canons, and continued such till its suppression, when the site and buildings were granted to cardinal Wolsey for his college of Christchurch.

St. George's College stood within the castle. It was founded and endowed in 1074, by Robert de Oigly and Roger Iveri, for secular canons, who were dispersed in 1149.

Osenev Abbey was originally a priory for Austin canons, founded by Robert de Oigly, nephew to the founder of the castle, but was shortly after constituted an abbey. The abbey church was for a few years the cathedral church of the see of Oxford, at its first establishment. This religious house was situated on one of the small islets formed by the Isis, at a short distance from the site of the castle, where its ruins may still be traced.

Rowley or Ruley Abbey was founded by Edmund, earl of Cornwall, and filled with monks of the Cistercian order, about the year 1280. Some fragments of the buildings of this monastery still remain in the western suburbs.

St. Bernard's College was founded in 1436, by Henry Chichele, archbishop of Canterbury, for student monks of the Cistercian order. Its site is now occupied by St. John's college, having been purchased by sir Thomas White from the dean and canons of Christchurch, to whom it had been granted at the dissolution.

Canterbury College, founded by Simon de Islip, archbishop of Canterbury, for students in religion and civil law, is now included in Christchurch college, having been granted to the dean and canons of that cathedral, shortly after the general suppression.

Durham College stood on the site now occupied by Trinity college. It was founded and endowed in 1290, by the prior and monks of the cathedral convent of Durham, for young students of their own order. At the dissolution, it was granted to the dean and chapter of that church, by whom it was transferred to sir Thomas Pope.

Gloucester Hall or College owed its origin to sir John Giffard, lord of Brimesfield, A.D. 1283. After the suppression, it became the palace of the bishops of Oxford; but was soon resumed by the crown, and subsequently fell into the possession of sir Thomas White. The buildings of this hall at present constitute a part of Worcester college.

London College was originally Burnell's Inn, but changed its designation about the year 1421; from which time it was inhabited solely by black monks and secular students in the civil law, till its dissolution.

St. Mary's College was founded in 1435, by Thomas Holden and his wife, for student canons of the Augustine order. The site of it was granted by Henry VIII. to William Ramefden and Richard Vafavor.

St. Bartholomew's Hospital stands about half a mile eastward from the city. It is of great antiquity, and generally supposed to have been founded by Henry I. King Edward III. gave it, A.D. 1328, to Oriel college, upon condition of that society maintaining therein a chaplain and eight poor brethren.

St. John's Hospital, which occupied the site of the present college of St. Mary Magdalene, was in existence as early as the reign of king John; but the precise date of the original foundation is unknown. It appears, however, to have

have been new founded, or at least new built, A.D. 1233, by king Henry II., who laid the first stone himself. In 1456 it was conveyed to William Waynflete, bishop of Winchester, who erected on its site his magnificent college.

The *Austin Friars* founded a priory here in 1268, on a piece of ground in the parish of Holy-crofs, or Holy-well, given to them by king Henry III., at the instance of sir John Haudlo. At the suppression, the site was sold to the duke of Suffolk, from whom it was purchased by Mrs. Wadham, and the college which retains her name erected thereon.

The *Dominican, Preaching, or Black Friars*, in the first year of their arrival in England, A.D. 1221, built a house and a chapel in the parish of St. Edward, on a plot of ground given them by Isabel de Balbec, widow of Robert, earl of Oxford. This place, however, afterwards proving too confined for them, they removed, about 40 years after, to a small island near the Watergate, where they continued to reside till the dissolution.

The *Franciscan or Grey Friars* had their house in the parish of St. Ebb. The chief founder and benefactor of this establishment was H. III. It was granted, 36 H. VI., to Richard Andrews and John Howes.

The *Carmelite or White Friars* first settled in Oxford A.D. 1254, in a house given them by Nicholas de Meules near the river, opposite to Rowley. About 60 years afterwards, however, they were transferred by king Edward II. to the ancient palace of Beaumont, which they possessed till the suppression.

The *Crouched or Crossed Friars* first fixed their habitation in Grantpoint, near Broadgate-hall; but about the year 1348, they procured a house and chapel in the vicinity of the church of St. Peter's in the East.

The house of the *Friars-de-Sacco, or de penitentia Jesu*, stood near the West-gate, on the site of the very ancient church of St. Benedict or Burdoc. These friars were suppressed, with some other mendicant orders, A.D. 1307, when the house and its appurtenances were bestowed on the Grey friars.

Trinity House was founded by Edmund, earl of Cornwall, in 1291, for the reception of "Trinitarian friars of the redemption of captives," who resided here, and in the chapel of the Holy Trinity within East-gate, till nearly the time of the general dissolution.

The *Palace of Beaumont* above mentioned, as bestowed on the Carmelite friars, stood on the west side of the city. It was built by Henry I. before the year 1128, and continued to be a favourite regal residence during several succeeding reigns. Henry II. spent much of his time in this palace, which had the honour of giving birth to his gallant son, Richard I. All the buildings were pulled down at the dissolution except the hall, the materials of which were afterwards used by archbishop Laud, in his additions to St. John's college. Only a small low fragment of them, therefore, now remains, and this appears to have constituted a part of one of its inferior divisions.

The *Castle*, built, or, as King supposes, restored, by Robert de Oigli, was a fortress of prodigious strength, and occupied a great extent of ground close to the river Isis, towards the western side of the city. Being in a neglected state, and much decayed in the reign of Charles I., it was repaired and rendered a post of defence by that monarch; but after it became possessed by the parliament, a great part of its buildings were demolished. Hence the only remains of it now in existence are the mount, a crypt, and the shell of one of the original towers, which is a square, massive

structure, lighted by a few loop-holes only, and having a projecting bastion turret at one angle, through which a narrow stair-case leads to the top of the castle. It now constitutes part of the gaol.

Eminent Natives of Oxford.—Though this city has been for so many ages the seat of learning, and "nursery of talents," it does not appear to have given birth to many eminent or illustrious characters. Besides Richard I., we do not find the names of any very conspicuous personages ranked among the native "worthies" of this city. The following persons, it is believed, constitute nearly the whole number: Thomas Cowper, bishop of Winchester, Thomas Harriot, who invented the present mode of notation in algebra, the Rev. William Chillingworth, sir William D'Avenant, Dr. Charles D'Avenant, his son, Dr. Edward Pococke, Anthony A. Wood, (see a very ample memoir of him in "Athenæ Oxonienses," 4to. 1813,) sir Matthew Wright, Barten Holyday, William Joyner or Lyde, Gerard Langhane, author of an account of the English dramatic poets, Samuel Welles, and Dr. Edward Wootton.

The preceding account of Oxford has been derived from personal knowledge of the city, and from several publications of the best authority; but it is regretted that the nature of the present work will not admit of a more copious narration. The chief books consulted are "The History and Antiquities of the University of Oxford," by Anthony A. Wood, M.A., edited and much enlarged by John Gutch, M.A., in 5 vols. 4to., published in the years 1786, 1790, 1792, and 1798. This work contains a large mass of information, the most essential facts in which, with the addition of much biographical and critical materials, are introduced into "A History of the Colleges, Halls, and public Buildings attached to the University of Oxford, including the Lives of the Founders, by Alexander Chalmers, F.S.A.," 2 vols. 8vo., 1810. The author of this interesting work promises, in his introduction, "to enter more fully into the history of the university, from the earliest times." "The Oxford University Calendar for the year 1813," 12mo., is an entirely new publication, and is a very useful and interesting vade mecum. "The Oxford Guide," or "Companion," is a superficial little volume, and unworthy of this learned city. It was satirized by T. Warton, in "A Guide to the Companion, and Companion to the Guide." "Oxoniana," 4 vols., 12mo., contains many curious anecdotes relating to the university, city, and to persons connected with both. In "The Beauties of England," vol. xiii., Mr. Brewer has given a very judicious epitome of the history of Oxford, with accounts of all the principal places in the county. "The History of the University of Oxford, with 80 coloured Engravings," to be completed in 2 vols. 4to., is an elegant work now publishing in monthly numbers. The following publications contain much valuable and useful information respecting different colleges: Wood's *Athenæ Oxonienses*, a new edition of which is now printing under the careful and able editorship of Philip Bliss, fellow of St. John's college; Churton's *Lives of the Founders of Brazen-nose College*; Lowth's *Life of William of Wykeham, founder of New College*; Warton's *Life of Sir Thomas Pope, Founder of Trinity College*; Chandler's *Life of William Waynflete, Founder of Magdalen College*; Spencer's *Life of Henry Chichele, Founder of All-Souls College*.

OXFORD, a township of America, in Worcester county, Massachusetts; 11 miles S. of Worcester, and containing 1237 inhabitants.—Also, a town taken from the north part of Derby, in Connecticut, 17 miles N.W. of New Haven; containing 1400 inhabitants.—Also, a post-town of New York, in Chenango county, between Jericho and Norwich;

incorporated in 1793, and containing an incorporated academy, and 1405 inhabitants.—Also, a township of New Jersey, in Sussex county, on the E. bank of Delaware river, 15 or 20 miles N.E. of Easton, in Pennsylvania, containing, in 1790, 1905 inhabitants.—Also, a township of Pennsylvania, in Philadelphia county; containing 1518 inhabitants.—Also, a township in Grenville county, upper Canada, situated in the rear and to the northward of the townships of Edwardsburg and Augusta, and watered by the Rideau.—Also, a township upon the Thames, in the western district, Upper Canada, S. of Dundas-street, where the western end of that road meets the upper forks of the river Thames.—Also, a town in New Hampshire, Grafton county, containing 988 inhabitants.—Also, a town called Upper Oxford, in Chester county, Pennsylvania, having 620 inhabitants.—Also, a port of entry, on the E. shore of Chesapeake bay, in Talbot county; 13 miles S. by W. of Easton, and about 48 S.E. of Baltimore.—Also, a small post-town of North Carolina; 36 miles from Hillsborough, and about 416 from Philadelphia.

OXFORDSHIRE, one of the central counties of England, is bounded by Gloucestershire on the west; by Buckinghamshire on the east; by Berkshire on the south, south-west, and south-east; by Northamptonshire on the north; and by Warwickshire on the north-west. In figure this county is extremely irregular, being only seven miles in breadth in the centre, while its southern division is about twelve miles in diameter, and its northern half varies from little more than a mile, to thirty-eight miles in width. This latter portion, in proceeding northward from the centre, assumes the form of a cone, which terminates at what is denominated the Three-shire stone, in a complete point or apex. The total area of the county is computed, by Mr. Davis, at 742 square miles, or 450,000 acres, of which 309,000 lie to the north, and 141,000 to the south-east of Oxford; but in the table of poor rates drawn up under the inspection of the right honourable George Rose, the number of acres is estimated at 474,880.

Historical Events.—When the Romans obtained possession of Albion, Oxfordshire, with some portion of the county of Gloucester, constituted the dominions of a British tribe called the *Dobuni*, who, according to Camden, derived their name from the word *Duffen* or *Dwfn*, which signifies deep, or low; because inhabiting a plain or valley encompassed with hills. Other writers, however, suppose their appellation to be a compound of the terms *dob*, a stream, and *en*, land; in allusion to their residence in the vicinity of the river Isis or Thames. The Dobuni seem to have been of a less warlike disposition than most of their neighbours. Before the arrival of the Romans, they were held in subjection by the Catteuchlani, whose domination was so galling, that the Dobuni immediately embraced the protection of the new invaders, and were admitted as tributary allies of the Roman people. Hence Cogidumnus, their legitimate prince, was not only continued in the government of his own territories, but had other states placed under his authority. The same power and privileges descended to his successors, each of whom, in union with his subjects, evinced on all occasions a firm adherence to their illustrious superiors, during the whole period of the residence of the Romans in Britain.

But though the Dobuni yielded thus easily to the yoke of Rome, they disdained to bend without a valiant resistance to the treacherous Saxons, whom their king unhappily concurred in inviting to England, to assist in repelling the invasions of the northern barbarians. These, on the contrary, they opposed with as much firmness and resolution as animated the inhabitants of any other district, and were indeed

among the last of the Britons who could be brought to submit to the Saxon dynasty. When this event happened, however, and the heptarchy was fully established, Oxfordshire became part of the powerful kingdom of Mercia, and remained annexed to that monarchy to the latest period of its independence. During this era, Dorchester was made the seat of a bishop's see, afterwards removed to Lincoln, in the reign of William the Conqueror. The name Dobuni was at the same time lost, and that of Wiccii applied to the inhabitants of the whole district which that tribe had formerly possessed.

Towards the end of the ninth century, when the Danes first penetrated into Mercia, they fixed their headquarters for some time at Reading, in Berkshire, and ravaged all the south-eastern part of the county of Oxford. On this occasion little opposition appears to have been made to their inroads by the Wiccii; but in the subsequent contests which ensued between the Danes and the Saxons, several very obstinate and furious engagements were fought within the limits of Oxfordshire. Hock-norton is remarkable for a dreadful slaughter of the Kentish division of the army of Edward the Elder, by the Danes, and the Five Burgher insurgents under the command of Ethelwald. The victory, however, was dearly purchased, and Ethelwald having fallen, Edward had the satisfaction of finding himself freed from a dangerous competitor.

In the wars between the houses of York and Lancaster, several persons of eminence belonging to this county lost their lives and properties; but it had the good fortune to escape the destructive ravages, which at this period desolated many other districts of the kingdom. In one instance only did the partizans on either side enter Oxfordshire in arms. This was in the year 1469, when the earl of Warwick took post near Banbury, and soon after completely overthrew the Yorkists, under the command of the earl of Pembroke, whom he took prisoner, and thus paved the way for the temporary restoration of Henry VI. The scene of this decisive action was the plain called Danesmore, on the border of the county.

Oxfordshire, however, was not so much favoured during the next great civil contests, which divided the people of England, and deluged her fertile fields with the blood of her own citizens; for though the inhabitants do not seem to have embraced with senseless zeal either the republican or the royal cause, it was their calamity to feel the iron rod of war with peculiar severity. The contending armies frequently traversed the county from one extremity to the other, levying contributions, and committing excesses equally destructive to the great body of the people, whether the troops in possession marched under the banners of the king, or of the parliament.

General Aspect, Soil, and Climate.—Oxfordshire exhibits considerable variety of aspect. In its southern division, an alternation of hill and dale is productive of many pleasing displays of pictorial scenery. The Chiltern hills, partly clothed with wood, and sometimes arable, almost to their summits, possess a rich diversity of appearance. The middle district of the county is destitute of this inequality of surface so favourable to beauty, but it is well wooded and highly fertile. In proceeding more to the north the same flatness prevails, and as the fields are generally inclosed by stone fences, the eye “is often fatigued by a rude and frigid monotony of scene.”

The soils of Oxfordshire are divided by Mr. Young, in his Agricultural Survey, into four different classes, of which, he observes, three are so marked by nature, as to allow of little doubt respecting them. These are the Redland, the

Stonebrash,

Stonebrash, and the Chiltern. The Redland abounds chiefly in the northern district, and is certainly the best soil in the county. "It is deep, found, friable, yet capable of tenacity; and adapted to every plant that can be trusted to it by the industry of the cultivators." The extent of land in which this soil prevails is 79,635 acres. The Stonebrash district is more extensive, and includes the greater part of the middle division of the county. It is estimated to contain 164,023 acres, almost the whole of which is inclosed. The predominant feature of this tract is a "surface of greater or less depth, of a loose, dry, friable sand or loam, apparently formed of abraded stone, and abounding with many fragments of it." It is excellently adapted for turnips, and is likewise calculated for the culture of wheat. The Chiltern district to the south consists of 64,778 acres of a sandy loam, of more or less depth, intermixed with flints, and resting on a bed of chalk, which is in some places very white and pure, but in others imperfect, and in all containing a great proportion of calcareous earth. The other soils in the county are ranged under the general appellation of "miscellaneous loams," which are calculated to occupy 166,400 acres. They include all sorts of soil, from loose sand to heavy clay.

The climate of Oxfordshire, as may be supposed, is considerably affected by the surface varieties we have just mentioned. In the northern division, where the country is inclosed principally by stone fences, and where plantations are scanty, the air is generally cold and piercing during the greater part of the year, and excessively hot in the summer months. It is cold, also, throughout the whole Chiltern district, especially on the poor chalk lands, at the foot of the hills, where it is remarked that the frost will take effect sooner, and continue longer, than on the deeper lands in the vicinity. In warm seasons, the same district is usually moist, owing to the fogs, which are more frequent on the hills and woods than in the vales.

Mineralogy.—Oxfordshire possesses little to boast of in a mineralogical estimate. Dr. Plot, indeed, supposes that a silver mine was wrought formerly in the Chiltern district, but this opinion we are inclined to regard rather as an hypothetical conclusion, than the result of obvious deduction. At present no metal whatever is found in any part of the county. Freestone quarries, however, are frequent, and both limestone and slate are plentiful. Near Shotover is a considerable quantity of ochre, which the learned naturalist above-mentioned characterises as "the best of its kind in the world, being of a true yellow colour, and very weighty." The clays in the neighbourhood of Oxford were anciently used by potters with some success, but their quality is very inferior for the purposes of pottery to the clays of Staffordshire, and the manufacture has been long discontinued.

Rivers.—No county in England is more plentifully supplied with rivers than that of Oxford. Dr. Plot says there are no less than seventy distinct streams, which either take their rise in this county or flow through it, nor do we believe the number is at all exaggerated, though at the same time it must be admitted that only a few of them are entitled to the denomination of considerable rivers. The principal of them are the Thames, the Isis, the Charwell, the Evenlode, the Glym, the Ray, and the Windrush. The whole of these rivers unite with each other at different points of the county, and eventually constitute the Thames or Tamisis. The chief branch of this river enters Oxfordshire, under the denomination of the Isis, at Kelsicote, and proceeds in an irregular channel by Tyneham, Godstow, Oxford, and Abingdon, in Berkshire, to Dorchester, where it is joined by the Thames, and is then called the Thames. Thence it continues its course by Wallingford, Goring, Whitechurch and

Caversham, to Henley, near which town it passes into Buckinghamshire. Throughout the whole of its current by Oxfordshire this river forms the boundary between it and the county of Berks, and exhibits in the scenery of its banks much variety and beauty of aspect.

Tenures, Estates, &c.—The tenures, by which the landed property of Oxfordshire is held, are analogous to those most common in all the southern counties of England. Freehold and copyhold leases for lives are prevalent, but more particularly church and college leases, both for lives and for a certain term of years. The usual fine is one year and a half's rent. Estates of course vary greatly in extent. Some few noblemen and gentlemen have very large possessions here. These, with the estates belonging to the church, and different corporate bodies in the university, occupy a great proportion of the landed property of the county. There are, however, many middling proprietors and some of a smaller class. A few of the former, and almost all of the latter, cultivate their own grounds, and, generally speaking, appear to live in a respectable and comfortable manner. The price of land here is averaged by Mr. Turner at 26 years' purchase.

Leases, Size of Farms, Rents, Tithes, &c.—Oxfordshire, notwithstanding all the advantages of learning it possesses, must be ranked among those counties in which the leading principles of agricultural prosperity are either misunderstood, or neglected from false and interested motives. The system of leases, so decidedly favourable to the improvement of property, is here almost totally neglected; and even in those cases where leases are granted, their duration is limited to so short a period as to render them of little avail. From this general remark, however, a few gentlemen ought undoubtedly to be excepted, who usually grant leases for fourteen or twenty-one years, upon a decided conviction of the utility of the practice, which it is wonderful any individual should question. "Let all England," said one of these gentlemen justly to Mr. Young, "be farmed without leases, and tithe every where taken in kind, and England from that hour starves." The subject, therefore, is important, and deserves the most serious attention; for the plan of no-leases, being at once injurious to the cultivator and to the landlord, must consequently retard the national prosperity.

Farms in this county differ considerably in extent, but they are mostly inferior in size to those in the other counties of England. In the forest division there are few farms which pay more than 20*l.* a-year of rent. In the rich Thame district they seldom exceed 300 acres. About Stoken-Ash there are none capable of maintaining more than 200 or 300 sheep. For some miles round Blenheim, farms are in general from 100 to 500 acres, here and there a larger, and some smaller. Rents are thus averaged by Mr. Young; Redland 30*s.*, Stonebrash 20*s.*, Chiltern 16*s.*, and miscellaneous loam 25*s.*; so that the average of the whole county is 22*s.* 10*d.* per acre, and its entire rental about 543,297*l.* 1*s.* 6*d.* This average, however, is probably somewhat increased since the date of that gentleman's report in 1807.

Tithes are of different descriptions in this county. Some rectors have one in fifteen and some one in twenty only. The average of commutation for arable land fairly let, is one-fourth of the rent. On other grounds, however, it is much lower.

Agriculture.—Notwithstanding the disadvantageous circumstances above-mentioned, it is but justice to the Oxfordshire farmers to remark, that the practice of agriculture has made rapid strides in improvement within the last century.

The

OXFORDSHIRE.

The system of common field husbandry has been gradually sinking in repute, and the whole county is now nearly inclosed. The rotation of crops varies according to the soil. In the Redland district the usual course is 1, turnips; 2, barley or spring wheat; 3, clover; 4, wheat; 5, beans or peas; 6, oats. On the Stonebrash lands; 1, turnips; 2, barley, with clover, rye grass, or trefoil, or mixed; 3 and 4, clover, &c. as above for one or two years; 5, wheat, on once ploughing; 6, oats, peas, or beans; 7, sainfoin. In the Chiltern district the course is nearly similar: 1, turnips; 2, barley; 3, clover, or trefoil and ray-grass; 4, wheat, and 5, oats, barley, peas, or vetches. Among the crops only partially cultivated here are lentils, rape, cabbages, carrots, potatoes and chicory. Rhubarb is still also grown near Drayton, but the culture of hemp, flax, and hops, (all of which used to be raised in considerable quantities,) is now almost entirely neglected.

From the number of its rivers Oxfordshire abounds in meadows and pastures; but these are no longer, as in the time of Gibson, the "greatest glory" of the county, being much circumscribed by the encroachments of arable cultivation. A large tract of meadow land, on the banks of the Charwell, has been greatly injured by the construction of the canal from Oxford to Banbury. At Water Eaton is the best grass land in the county. It is under-dairies which indeed constitute the appropriation of most of the meadow and pasture grounds in Oxfordshire. Butter is the chief article made, only a small proportion of cheese being made for sale. The long horned breed of cows is that generally preferred here. In the middle parts of the county a few oxen, cows and sheep are fattened; and a number of calves are suckled for the London market. No watered meadows are found in Oxfordshire, though many places are extremely well adapted for their formation.

Forests, Woods, and Plantations.—Oxfordshire is said by Camden to have been anciently famous for its woods; and even at present, except in the more northerly parts, it is better supplied with trees than most other counties of England. The only forest, however, within its boundaries, is that of Whichwood, which comprehends 6720 acres, 1 rood, and 39 poles. In this forest, the oak, the ash, the beech, and the elm, are intermixed; but the oak is most abundant and thriving, and, in the course of half a century's growth, will be perfectly fitted for naval purposes. The Chiltern district is profusely covered with beech, produced almost entirely by the falling of the beech mast, very little being permitted to grow on the old stools. Some have supposed this division of the county formed part of the great forest, described by Leland as stretching 120 miles westward from the borders of Kent. This opinion, however, is merely conjectural, though in some degree plausible.

The other principal wood-lands in this county are those at Stanton-St.-John, called the "Quarters," and at Blenheim, the seat of the duke of Marlborough. Smaller plantations are numerous: almost every gentleman's seat in Oxfordshire being more or less surrounded with trees of different ages and sorts.

Waste Lands.—The only tracts of waste land, of any very considerable extent, are those situated in the parishes of Whichwood-forest, and the deanery district, termed Ottmoor, which lies in the vicinity of Islip. The last, which contains about 4000 acres, is commonable to eight adjoining townships. The whole of it is extremely flat and wet, and consequently unwholesome to cattle, as well as prejudicial to the neighbourhood. The soil, however, is good, and if drained, (which might be easily effected,) and inclosed, would undoubtedly prove highly amenable to the purposes

of agriculture. The value of the grounds would thereby increase to probably ten times their present amount. The same may be said of the waste lands of Whichwood, and of the small commons in the northern district; but those in the Chiltern division are not susceptible of much culture.

Roads and Canals.—The roads of Oxfordshire, till within these last few years, were deplorably bad. Young, in his "View of the Agriculture" of this county, observes that, 40 years ago, "the high roads were in a condition formidable to the bones of all who travelled on wheels." The same writer also characterises the cross roads as impassable at that period, without real danger. Now, however, a great improvement has taken place: good turnpike roads intersect the county in the direction of all its market-towns, and the greater part of the parochial and cross-ways are improved in a proportional degree.

The only canal yet cut through any portion of Oxfordshire is that which enters the county at its northern extremity, between Claydon and the Three-shire-stone. "Approaching the vicinage of the river Charwell at Cropredy, it proceeds at a small distance from the banks of that river to the city of Oxford, (whence it is called the Oxford canal,) where its channel terminates, and is succeeded by the navigation of the Isis." The probable advantages which will accrue from this cut are very great, as a direct water communication has been thereby opened between the interior of the county, and Birmingham, Liverpool, Manchester, and the Wednesbury collieries, as well as with the cities of London and Bristol.

Civil and Ecclesiastical Divisions.—Oxfordshire is divided into fourteen hundreds, which together contain 1 city, 12 market-towns, and 207 townships and parishes, all of them in the diocese of Oxford, and province of Canterbury. According to the parliamentary returns of 1811, the number of houses in the whole county was 23,217, and the number of inhabitants 119,191. In 1801, the houses were estimated at 20,599, and the population at 109,620 persons. Oxfordshire is represented in parliament by nine members; two knights of the shire, two citizens for Oxford, two representatives for the University, two burgesses for Woodstock, and one for Banbury.

Manufactures.—Hitherto, at least, Oxfordshire has had little claim to be ranked among the number of the manufacturing counties of England. Its articles of manufactured produce are neither numerous nor of great importance. Witney blankets, indeed, were formerly much noted; but this branch of trade is now declined, and the town is reduced to a comparatively poor and destitute condition: for though the introduction of machinery has revived, in a small degree, the business of the masters, that circumstance has not contributed to the benefit of the labouring poor. At Woodstock is a small manufacture of polished steel articles, which was introduced by a Mr. Medcalf, and was at one time in a very flourishing state. Here is likewise a manufacture of leather breeches and of gloves, which employs about 70 men, and 1400 or 1500 women and girls. The wages of the men are from one guinea to 30s. weekly, and those of the women from 8s. to 12s. per week. A small quantity of lace is made in the town and neighbourhood of Thame; and at Bloxham and Banbury a coarse sort of velvet is produced. Henley has, for several centuries, been one of the London depots for malt.

Antiquities.—Oxfordshire certainly does not offer such a field for antiquarian research as many other counties; but, nevertheless, it affords some materials in this branch of inquiry, by no means unworthy of attention. Several very curious British coins have been found within its limits, and

there

there are numerous barrows and other monuments here, which, we presume, may properly be referred to an era antecedent to the records of history. Of this description is the Druidical monument, called *Rollrich*, or *Rowlright Stones*, which were originally 60 in number, (though only 22 of them are now standing,) and formed a circle nearly equal in diameter to the outer one at Stonehenge. The sizes of these stones, however, are trifling, compared to the immense masses of the Wiltshire temple, few of them exceeding four feet in height, and sixteen inches in breadth. One only, in the northern part of the circle, is seven feet high, and five and a half broad; but detached is another, measuring eight feet in height, and seven in breadth. This last is denominated the King-stone, from a tradition that some ancient monarch and his court were converted into stones on this spot. Contiguous to it is a large long barrow, supposed to contain the ashes of an arch-druid; and near it is a square entrenchment, with a double ditch and vallum, having some remains of stone-work in its interior. These Dr. Stukeley calls Druid-courts, or houses. Several other barrows, with the apparent foundations of buildings close to them, are discovered in the vicinity of this temple; and about 300 paces from it was formerly a kistvaen of six stones, which have been lately removed. See KISTVAEN.

Owing to the continued amity which existed between the inhabitants of this district and the Romans, the relics of Roman military possession are few. No doubt, however, that celebrated people had several stations in Oxfordshire, of which the principal was at Aldchester or Alcester. Dorchester and Swadcliff are likewise supposed to have been Roman towns, or posts, of considerable importance. Coins of the emperors, and fragments of tessellated pavement, are frequently dug up, and there are a few small encampments and funeral mounds dispersed throughout the county, which are also probably of Roman origin. Of these last, the most remarkable is that termed Aftal barrow, which borders on the Old Akeman road, and which is conjectured by Dr. Plot to be the sepulchre of some distinguished leader, on account of its uncommon height and circumference. Of the four principal Roman roads intersecting the island, one only passes through Oxfordshire. This is the Ikenild-street, which enters the county at the parish of Goring, and crosses it in a direction from south-west to north-east by Ispden, Ewelme, Watlington, and Crowell, to Chinnor, where it enters Buckinghamshire. Vicinal ways, however, are abundant. The Akeman street stretches itself throughout the broadest part of the county, entering it near Holywell, and leaving near Ambrosden, in the vicinity of the station Alcester. From this street many minor roads branch off in different directions. Two of these are traced near Kirklington, a third within Blenheim-park, and a fourth to the south of Bicester. Between Mongewell and Nuffield is a vallum, or high ridge-way, called Grimes-dyke, or Devil's-ditch, also numbered by Dr. Plot among the Roman vicinal ways, but we are inclined to refer it to a more remote era. This embankment is still very high, and has in some places a single, and in others a double agger.

The most eminent places in the county, during the government of the Saxons and Danes, were Banbury, Benington, Birencester or Bicester, Burford, Thame, Chipping-Norton, Bampton, Woodstock, and Islip. The two last were royal villas. King Edward the Confessor was born at Islip; and Woodstock afterwards became famous as a palace of the monarchs of the Norman dynasty. Several Saxon and Danish encampments may likewise be traced within the limits of this county, particularly at Castleton, Adwell, and Chipping-Norton.

After the Conquest, king William ordered a number of castles to be erected in this county, as in most others in England, with the view of ensuring the submission of his new subjects. Of these fortresses, the principal in Oxfordshire were the castles of Oxford, Bampton, Banbury, Deddington, Ardley, and Middleton, all of which were places of great strength, and still retain marks of their former extent and consequence as military positions. A few fortifications of a much later period are also met with in different districts of the county.

As a subject of antiquities, we shall conclude this article with a short list of the various religious houses which have existed in Oxfordshire, whether before or since the arrival of the Normans, excepting only those already mentioned in our description of Oxford. They are as follow:

1. A college at Banbury, dedicated to St. Mary, and endowed with 48*l.* 6*s.* per annum.
2. An hospital in the same town, dedicated to St. John, for the reception of lepers.
3. A Cistercian abbey at Bruerne, founded by Nicholas Basset, A. D. 1147.
4. A monastery for Austin canons at Bicester, founded by Gilbert Basset, baron of Hedingdon, A. D. 1182.
5. An hospital, at the same place, founded A. D. 1355.
6. An hospital, or priory, at Burford, dedicated to St. John.
7. An Austin cell to the abbey of Nottely, at Caversham.
8. An alien priory, at Charlton, cell to the abbey of St. Ebrulf at Utica, in Normandy.
9. A Gilbertine priory at Clattercote, dedicated to St. Leonard. It was for some time an hospital for lepers.
10. An alien priory of Black monks at Cogges, cell to the abbey of the Holy Trinity at Fischamp in Normandy. It was founded about the year 1100.
11. An hospital at Crowmarsh, founded for sick brethren, A. D. 1248.
12. The cathedral church at Dorchester, was established about the year 635, by Birinus, first bishop of that see.
13. An abbey for black canons of the order of St. Augustine, at the same place, founded by Alexander, bishop of Lincoln, A. D. 1140.
14. A Benedictine abbey at Eynsham, built and endowed by Ailmer, earl of Cornwall, before A. D. 1005.—Restored by Robert Bloet, bishop of Lincoln, in the reign of Henry I.
15. An hospital at Ewelme, founded and endowed by William de la Polc, earl of Suffolk, for two chaplains and thirteen poor men. A. D. 1437.
16. A Benedictine nunnery at Godstow, built A. D. 1138, by Editha or Ediva, a religious matron, assisted by the contributions of other pious persons. The consecration of this abbey was performed in the presence of king Stephen, his queen, and a vast concourse of prelates and nobility. The celebrated Rosamund Clifford, mistress to Henry II. was buried here.
17. A priory of nuns of the order of St. Austin, at Goring, founded temp. Hen. II.
18. A house for sisters of the order of St. John of Jerusalem, at Gosford, founded soon after the Conquest; but removed in 1180.
19. A priory of Benedictine nuns at Littlemore, founded temp. Hen. II. Suppressed and given to cardinal Wolsey, A. D. 1524.
20. An alien priory of Benedictines at Minster Lovel, a cell to the abbey of St. Mary de Ibreio, or Iri.
21. A Bene-

21. A Benedictine cell at Milton to the monastery of Abington.

22. An Austin priory at Norton, built by William Fitz-Alan the second, temp. Hen. II.

23. A house for knights templars at Saundford, founded about temp. Stephen.

24. A Benedictine nunnery at Stodley, built and endowed by Bernard de Walerico, in the reign of Henry II.

25. A Cistercian abbey at Thame. This society was originally founded at Otteley, in the parish of Oddington, by sir Robert Gait, but was shortly after removed thither. Alexander, bishop of Lincoln, gave the ground on which this monastery was built, A. D. 1137.

26. An hospital also in this town, founded by Richard Quatermain, either in the reign of Henry VI., or of king Edward IV.

27. A house of Trinitarian friars at Thusfield, or Thufield, founded before 33 Edw. III.

28. An hospital of St. Mary in Woodstock.

29. A priory of Austin canons at Uroxtan, founded in the beginning of the reign of king Henry III. by Michel Belet. Granted to sir Thomas Pope. [Camden's Britannia, by Gough, 3 vols. folio. Beauties of England and Wales, vol. ix. by J. N. Brewer. Natural History of Oxfordshire, by Robert Plot, LL.D. Oxford, edit. 1677. Tanner's Notitia, fol. Magna Britannia. View of the Agriculture of Oxfordshire, by Arthur Young, secretary to the Board of Agriculture, 8vo. London, 1809.]

OXGANG, or OXGATE of Land, is ordinarily taken, in our old law-books, for fifteen acres; being as much land as it is supposed one ox can plough in a year.

"Bovata terræ, q. d. quantum sufficit ad iter vel actum unius bovis."

In Lincolnshire they still corruptly call it *oskin* of land. This term is used in Scotland for a portion of arable land, containing thirteen acres.

OXHANGER, in *Geography*, a small island on the E. side of the gulf of Bothnia. N. lat. $63^{\circ} 19'$. E. long. $21^{\circ} 58'$.

OX-HARROW, in *Agriculture*, a term applied to a very large sort of harrow, called in some countries a drag.

OXIANA, in *Ancient Geography*, a town of Asia, in Sogdiana, near the Oxus; which see.

OXIANA *Palus*, a marsh of Sogdiana, called by Pliny Oxus, from the name of the river of which it is the source.

OXIBII, a people of the Maritime Alps, between the river Argens and Antibes. These people were powerful, and signalized themselves against the Romans, when they undertook the conquest of the Gauls. They leagued with the Deciales, for attacking the towns of Nice and Antibes. Steph. Byz. assigns to them a town called "Oxibium." Strabo mentions a port named "Oxibus" as belonging to them, supposed to be the same with the maritime town called by Polybius "Ægyptna."

OXNA, in *Geography*, a small island on the E. coast of Shetland. N. lat. $60^{\circ} 8'$. W. long. $1^{\circ} 52'$.

OXNAY, a river-island of England, in the county of Kent, formed by the divided streams of the Rother, about seven miles long, and three broad, containing three parishes, and giving name to a hundred.

OX-SHOEING MACHINE, in *Agriculture*, a simple contrivance employed by Mr. Young, in executing the business of shoeing these animals. It is brought to the attention of the public, in the twenty-sixth volume of his *Annals*, where he mentions that it is now almost twenty years that he has been in the habitual practice of using oxen for both plough and cart, and from the beginning was averse

from making any trials by *casting* them for shoeing. The late lord Nugent used many at Gostfield, in Essex, and from his machine for this purpose, he took the idea of his present one, which is represented in the *Plate Ox-Shoeing* (*Agriculture*) figs. 1 and 2; but the flumps for the fore-legs, and the moveable roller for the hind ones, he has added since, as well as altered the head apparatus, and added the hinder strap.

a, is the top-piece of the sliding-plank, to sink down and confine the head.

b, b, are broad strong straps of leather, fastened by links of iron, to prevent the ox from lying down on his belly, which they are apt to do; and the hinder strap is to prevent his drawing back to the injury of his head and neck.

c, c, are two flumps, strongly fixed in the ground, to tie the fore-legs to.

d d, is an iron that lets up and down, to confine the roller to which the hinder legs are tied for shoeing.

e, e, e, are holes (with others corresponding not seen in the plate) for the roller to be shifted according to the length of the ox.

It is suggested that the whole is so simple, that it is presumed any country carpenter may be able to build it without any difficulty, from inspecting the plate.

And it is well remarked that the shoeing of oxen is generally so ill done, that the shoes are perpetually coming off, which is a great objection and expence. And he has never had a blacksmith that did it well, so that upon land not stony or gravelly, he should not shoe at all, if they did not go upon the high roads. Whatever improvement can, by any means, facilitate the use of oxen in husbandry, deserves much attention, the importance of substituting them for horses rising with the price of meat, and it is with that view he has inserted this plate and explanation. See *SHOEING Oxen*.

OXUCIÆ, in *Natural History*, the name of a genus of fossils of the class of the selenitæ, but of the columnar, not the rhomboidal kind.

The word is derived from the Greek *οξύς*, *sharp*, and *κίον*, a column; and expresses a body of a columnar form, and pointed or sharp at the ends.

The selenitæ of this genus consist of six equal planes, having their top or bottom no broader or more depressed than the others; and in this differing from the *ischnamblyces*, or flatted columnar selenitæ, as they do from the *isamblyces*, or *crystalliform*, but broken ended ones, by having their ends naturally tapering off to a point.

The bodies of this genus, like those of the other genera of the columnar selenitæ, are liable to a longitudinal crack in their middle; and this sometimes includes a little clay, in the form of an ear of grass. See *SELENITÆ*.

Of this genus there are only two known species.

OXUS, GIHON, *Jihon*, or *Amu*, in *Ancient Geography*, a large river of Asia, which took its rise in the mountains of Bactriana, to the S.E. In pursuing its course towards the N.W., it traversed this province, passed between Aria to the west, and Sogdiana to the east; and afterwards entering into the territory of the Khorasmii, discharged itself into the lake called the lake of Aral. See *AMU*.

OXWICH, in *Geography*, a sea-port and parish in the cwmwd of Gwyr, cantref of Eginog (now called the hundred of Swansea) and county of Glamorgan, South Wales, is situated on a small promontory, to which it gives name, on the north coast of the Bristol channel, at the distance of thirteen miles from Swansea. A considerable trade in limestone is carried on here, and gives employment to a number of people in the vicinity. The sea has made great encroachments on this parish, and is even supposed to have inundated

inundated the whole of the original village, as the old church and parsonage-house stand close to the shore, and the present village is built at some distance inland. Here are the remains of a large mansion, called Oxwich castle, which was erected by Sir Rice Mansel, about the reign of Henry VIII. This edifice never appears to have been intended for the purposes of defence, but it may not unlikely have been built on the site of an ancient fortress, as only a few yards from it there are still to be seen the remains of a watch-tower of much older and stronger construction. Part of this castle was converted, many years ago, into a farm-house. Lobsters and crabs are caught in great plenty along the whole coast of this parish, which, according to the parliamentary returns of 1811, contains 50 houses, and 236 inhabitants.

Penrice-castle stands about three miles from Oxwich. It derived its name from the family of the Penrices, who settled here in the reign of Edward I., but is now the property of the Talbots. This demesne has lately been amazingly improved, and exhibits a diversity and richness of scenery altogether unexpected from the dreary appearance of the surrounding country. In the avenue to the gardens is a fine tomb of one of the emperors, which was brought from Italy. The village of Penrice has a good harbour for shipping.

North from this place, upon a mountain called Con-Bryn, is a table-like monument, or cromlech, called Arthur's stone. It consists of six or seven stones, about five feet in height, supporting a large flat stone, supposed to weigh nearly 20 tons. A spring issues from beneath, which ebbs and flows with the tide, and is celebrated as "Ffynnon Vair, or my Lady's Well." Carlisle's Topographical Dictionary of Wales, 4to. 1811.

Oxwich Point, a cape on the south coast of Wales, in the British channel, forming the eastern boundary of a bay called "Oxwich bay." N. lat. $51^{\circ} 27'$. W. long. $4^{\circ} 6'$.

OXYA, in Botany, a name by which many authors, especially the Greeks, have called the *fagus*, or beech-tree.

OXYBAPHUS, a name contrived, as it seems, by L'Heritier, in one of those rare monographs, of which we have mentioned six in our article on his life; see HERITIER. But *Oxybaphus* and *Tricratus* are cited by Willdenow, Sp. Pl. v. 1. 185 and 187, though not to be found in the catalogue of L'Heritier's own library, nor in that of Sir Joseph Banks. This countenances Cuvier's assertion, that none of his friends had all these dissertations; but we cannot account for his not having had them all himself, and it is not impossible that he might merely inform Willdenow by letter of the intended preparation of these two. Vahl indeed quotes the monograph on the genus before us, but he might copy Willdenow. The above generic name is evidently formed from *oxys*, four, or sharp, and *βαφειν*, a dyer; but whether the viscosity which covers the original species be of an acid or acrid quality, or not, no author within our reach has related, so that our explication is but imperfect. —Willd. Sp. Pl. v. 1. 185. Vahl. Enum. v. 2. 39. Mart. Mill. Dict. v. 2. Ait. Hort. Kew. ed. 2. v. 1. 77. (Calyxhymenia; Fl. Peruv. v. 1. 45.)—Class and order, *Triandria Monogynia*. Nat. Ord. *Nyctagines*, Juss.

Gen. Ch. Cal. Perianth inferior, of one leaf, bell-shaped, with five folds, and five broad, equal, shallow segments, permanent, sometimes three-flowered. Cor. of one petal, funnel-shaped; tube about the length of the calyx; limb spreading, in five equal, notched lobes. Nectary fleshy, surrounding the base of the germen. Stam. Filaments three, inserted into the nectary, thread-shaped, declining, rather unequal, various in length; anthers roundish, ascending. Pist. Germen somewhat stalked, superior, roundish, sur-

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rowed; style thread-shaped, the length and position of the stamens; stigma globose, ascending. Peric. none, except the permanent hardened base of the corolla. Seed solitary, ovate, with five angles, standing upon the dilated, spreading, permanent calyx.

Ess. Ch. Calyx five-cleft, bell-shaped. Corolla funnel-shaped. Seed solitary, coated, standing on the spreading permanent calyx.

Obs. This genus is separated from *Mirabilis*, on account of its short tube, lobed limb, three instead of five stamens, and calyx much dilated after flowering. The plants which compose it have an herbaceous, branched, round stem, stalked, opposite, slightly undulated leaves, one of them smaller than its companion. The herbage is mostly viscid and downy, and of a disagreeable odour. The stamens are said occasionally to vary to four.

1. *O. viscosus*. Viscid Umbrella-wort. Curt. Mag. t. 434. (*Mirabilis viscosa*; Cavan. Ic. v. 1. 13. t. 19.)—Downy and viscid. Leaves heart-shaped. Panicle racemose. Stamens longer than the corolla. Native of Peru, from whence it was sent, about twenty-five years ago, to the royal garden at Madrid, and thence communicated to various other collections. Root perennial, but usually treated as annual, like the *Marvels of Peru*. Whole plant covered with jointed, glandular, viscid hairs. Stem two feet, or much more, in height, erect, with opposite spreading branches. Leaves wavy, bluntly pointed, thickish, but soft and pliant, like those of *Mirabilis longiflora*. Panicle branched, viscid, many-flowered, its branches beset with whorls and short clusters of small purplish flowers, the lobes of whose corolla are inversely heart-shaped, and much shorter than the stamens and style. Calyx of the fruit pendulous, membranous, pallid, reticulated with veins. Seed less than a grain of wheat, with five tuberculated angles, dropping out of the calyx when ripe.

2. *O. glabrifolius*. Smooth-leaved Umbrella-wort. Vahl. n. 2. (Calyxhymenia glabrifolia; Ortega. Decad. 5. t. 1. *Mirabilis corymbosa*; Cavan. Ic. v. 4. 55. t. 379.)—Leaves heart-shaped, glaucous, smooth. Panicle corymbose. Flowers in terminal tufts. Stamens shorter than the corolla. Native of Peru and New Spain. Cultivated at Madrid. Ortega describes this as a glaucous plant, with the acrid flavour of a *Sedum*; glandular and villous when young, but nearly smooth when full-grown. Leaves acute, entire, rough with reversed hairs at the edges. Panicle hairy, forked, corymbose. Flowers small, purple, in tufts at the top of each branch of the panicle. Calyx tipped with red.

3. *O. ovatus*. Ovate Umbrella-wort. Vahl. n. 3. (Calyxhymenia ovata; Fl. Peruv. v. 1. 45. t. 75. f. b. Vahl.)—Hairy and viscid. Leaves ovate. Flower-stalks terminal, forked. Stamens nearly as long as the corolla. Stem erect. —Native of elevated spots in Peru.—Stem three feet high. Plant clothed with jointed, glandular, viscid hairs. Leaves thick and veiny, acute, entire, rough-edged. Panicle forked, with solitary single-flowered stalks. Corolla red, twice as large as the calyx, till the latter becomes dilated and membranous as the fruit advances. This is known only from the *Flora Peruviana*, as well as the two next.

4. *O. prostratus*. Prostrate Umbrella-wort. Vahl. n. 4. (Calyxhymenia prostrata; Fl. Peruv. v. 1. 46. t. 75. f. c. Vahl.)—Leaves ovate or heart-shaped, downy. Flowers axillary and terminal, somewhat corymbose. Stem prostrate. —Native of hills in Peru.—Stem three feet long, striated, slightly downy; branches alternate, forked in the upper part. Leaves slightly crenate, wavy, veiny. Flower-stalks from the forks of the branches, as well as terminal, or axillary, short, glandular, bearing from three to eight flowers on little partial

partial stalks. Segments of the *calyx* ovate. *Corolla* purple, thrice as long, plaited. *Vahl*.

5. *O. expansus*. Spreading Umbrella-wort. *Vahl*. n. 5. (*Calyxhymenia expansa*; *Fl. Peruv.* v. 1. 45. t. 75. f. a. *Vahl*.)—Leaves ovate, smooth. Flower-stalks terminal, forked. Stamens the length of the corolla. Stem erect.—Found on very dry hills in Lima.—Stem six feet high, striated. Leaves distant, obscurely crenate, rather wavy, acute, veiny; the floral ones nearly sessile. Flower-stalks terminal, forked in a corymbose manner, bearing from six to eleven flowers, on unequal partial stalks, which are but slightly viscid. *Calyx* downy and glutinous. *Corolla* purple, somewhat bell-shaped. Seed obovate, rough *Vahl*.

6. *O. aggregatus*. Three-flowered Umbrella-wort. *Vahl*. n. 6. (*Calyxhymenia aggregata*; *Orteg.* Decad. 81. t. 11. *Mirabilis aggregata*; *Cavan.* Ic. v. 5. 22. t. 437.)—Leaves lanceolate. Flower-stalks axillary, solitary. *Calyx* with about three flowers.—Native of New Spain. It flowered in 1798 at Madrid.—Stem a foot high or more, branched from the very base, striated, leafy. Leaves nearly sessile, about two inches long, opposite, lanceolate, thickish, wavy, smooth, rough edged. Flower-stalks axillary, sometimes from the forks of the branches, solitary, short, drooping when in fruit. *Calyx* bell-shaped, with unequal ovate segments, containing usually three flowers, rarely two or four, which are sessile, without any other perianth. *Corolla* reddish. Stamens the length of the corolla. The *calyx* is enlarged when in fruit, as in the other species. Seeds seldom more than two perfected, large, villous, at first enveloped by the *calyx*, which at length becomes expanded.

OXYACANTHA. See BERBERIS.

OXYBLATTA, among the *Ancients*, is used to denote a bright and glossy kind of purple colour.

OXYCANI, in *Ancient Geography*, a people of India, who occupied the territory now called Hajycan or Hajycan, a circar or division of Sindy.

OXYCEDRUS, in *Botany*. See JUNIPERUS.

OXYCOCCUS, from *οξύς*, acid, and *κοκκος*, a berry; the Cranberry. See VACCINIUM; from which some have disjoined this plant, because the *corolla* is very deeply divided, even to the very base; so that Roth, who has called this supposed new genus *Schollera*, describes it as tetrapetalous. He also takes for additional characters the tubular points of the anthers, and the approximation of their filaments. The last is surely of little avail, and the former occurs in *Vaccinium flamineum*, whose *corolla*, nevertheless, is perfectly monopetalous; as well as probably in many other species; these organs being variously constructed in that genus, like those of its relation *Erica*. Linnæus had long ago considered this matter, and he asserts in *Fl. Lapp.* ed. 2. 118, that “the great Tournefort was wonderfully deceived in considering the Cranberry as polypetalous; for if the flower be examined at its first opening, it will be found monopetalous, slightly four-cleft at the margin, though it subsequently splits, and falls off in four parts.” Did Dr. Roth establish his genus without considering this passage? He does not cite the work. See *Roth Germ.* v. 1. 170. v. 2. 442. We have only to add, that if this genus were established, *Oxycoccus* must remain with it, as an unexceptionable name.

OXYCRATE, OXYCRATUM, *οξύκρατον*, formed from *οξύς*, sharp, four, and *κρατῆρ*, I mix, in *Pharmacy*, &c. a mixture of water and vinegar.

The usual proportion is one spoonful of vinegar to five or six of water.

Oxycrate is proper to assuage, cool, and refresh. They make fomentations of oxycrate, clysters of oxycrate, &c.

OXYCROCEUM, formed from *οξύς*, sharp, four, and *κρόκος*, saffron, a preparation used in plasters for fractures, and to form calluses; composed chiefly of saffron, with gums dissolved in vinegar.

OXYD, or OXIDE, in *Chemistry*, a term that may be properly applied to any substances chemically combined with oxygen; but it is restricted to those that have not acquired acid properties by the combination. This term is chiefly used to express those modifications of metallic bodies formerly termed “calces.” See CALCINATION.

For the oxyds of antimony, arsenic, iron, lead, mercury, &c. see the several articles.

OXYDRACÆ, in *Ancient Geography*, a people of India, who inhabited the district now called Outch, near the confluence of the Acesines (Chunab) with the Indus.

OXYGALA, *οξύγαλα*, formed from *οξύς*, sharp, four, and *γάλα*, milk, four milk.

The Turks use this as a popular drink, and call it *igur*. Vigenere says, they drink four milk diluted with water; which is found to cool and nourish better than the milk alone.

OXYGARUM, a word used by the ancients to express a mixture of vinegar and garum, which is a pickle for preserving fish, or a simple mixture of sea-salt and water.

OXYGEN Gas, French nomenclature; *Dephlogificated air* of Dr. Priestley; *Empyreal and vital air* of others.

This important element is very generally diffused throughout nature. It exists in the atmosphere, and in water; it is often found in combination with metallic bases, and it constitutes one of the ultimate principles of almost all animal and vegetable matter. It is essential to the respiration of animals, and is frequently absorbed by plants, contributing to the healthy performance of some of their most intricate functions.

Oxygen gas was discovered by Dr. Priestley in the month of August 1774. He obtained it by heating red precipitate in a small glass retort connected with the hydro-pneumatic apparatus. This compound of quicksilver and oxygen is decomposed at a low red heat, the quicksilver distils over, and the oxygen assumes the gaseous form. In consequence of properties presently to be noticed, Dr. Priestley termed it *dephlogificated air*. While these experiments were carrying on in England, Scheele, in Sweden, was engaged in investigating the nature of the ores of manganese, and in the course of the year 1775, he procured oxygen gas without any previous knowledge of Priestley's discovery.

Lavoisier, in his “Elements of Chemistry,” English translation, p. 36. v. 1. says, “this species of air” (meaning oxygen) “was discovered about the same time by Mr. Priestley, Mr. Scheele, and myself.” In a pamphlet published in 1800 by Dr. Priestley, after his return to America, entitled “The Doctrine of Phlogiston established, and that of the Composition of Water refuted,” there is the following remark upon the subject of this brilliant and important discovery, which we transcribe without comment. “The case was this. Having made the discovery some time before I was in Paris in the year 1774, I mentioned it at the table of Mr. Lavoisier, when most of the philosophical people in the city were present, saying, that it was a kind of air in which a candle burned much better than in common air, but I had not then given it any name. At this all the company, and Mr. and Madame Lavoisier, as much as any, expressed great surprise. I told them I had gotten it from *precipitate per se*, and also from red lead. Speaking French very imperfectly, and being little acquainted with the terms of chemistry, I said *plomb rouge*, which was not understood till Mr. Macquer said, I must mean *minium*. Mr. Scheele's discovery

discovery was certainly independent of mine, though I believe not made quite so early."

Oxygen gas may be procured from a variety of sources, but two only are generally had recourse to. For delicate investigations, where it is required to be absolutely pure, it may be obtained by heating the compound termed *oxymuriate of potash*. One hundred grains of this salt, at a low red heat, yield from 100 to 110 cubical inches of oxygen in a state of great purity. For all the common purposes of experiment, however, it may be procured by heating to redness in an earthen or iron retort, the substance called *black oxide of manganese*, of which one pound in fine powder affords about 1400 cubic inches of tolerably pure oxygen gas. This oxyd of manganese is a very abundant article; it should be purchased in lumps, for when powdered, it is apt to be mixed with extraneous matter, which interferes with the production of pure oxygen; indeed, the first portions which pass off are rarely pure, and should be collected in a small tube, and tested by the introduction of an inflamed taper; if this burns with greatly increased brilliancy, the oxygen may be regarded as sufficiently free from impurities. Nitrate of potash or saltpetre, minium, or red oxyd of lead, and several other substances containing oxygen, afford it when heated to redness.

Oxygen may also be obtained by mixing the oxyd of manganese in a glass retort, with its weight of sulphuric acid (oil of vitriol); the heat of a patent lamp will then be sufficient to cause a copious evolution of the gas; there are, however, some black oxyds of manganese which evolve an abundance of the gas at a red heat, but yield it sparingly when acted upon by the acid; and *vice versa*. The cause of this has not been explained.

In all the above experiments, the manganese only loses a portion of its oxygen, the remainder being retained in combination with the metal by a very powerful attraction. The oxyd, after exposure to a red heat till it gives off no more gas, acquires a brown colour, and if it be moistened and exposed to the atmosphere, it is susceptible of absorbing oxygen, and may thus be again used as a source of the gas; it may also be used to procure *chlorine*. See OXYMURIATIC Acid.

The only foreign matter contained in the gas, derived from oxymuriate of potash, is a little aqueous vapour, from which it may be freed by exposure to caustic potash, or to fused muriate of lime; one or other of these substances may be introduced into the gas over quicksilver, and retained there until the whole of the moisture is absorbed, which is known by the fresh pieces of the substance remaining dry; the gas is then decanted into another vessel, and may be regarded as perfectly pure. In this state it exhibits the following characteristic properties.

It is permanently elastic at all known temperatures; colourless, transparent, and without smell and taste.

It is respirable, and may be breathed for some time without inconvenience.

Its specific gravity, compared to atmospheric air, is as 1003 to 1000; to hydrogen as 15 to 1. At a mean temperature and pressure, 100 cubic inches weigh 34 grains.

When an inflamed taper is immersed in oxygen gas, it burns with greatly increased splendour, and is much more rapidly consumed than in atmospheric air; and when the wick is merely glowing, it is instantly rekindled with a slight explosion. When steel or iron wire, with a bit of inflamed wood attached to it, is introduced into the gas, the metal burns with great brilliancy, and throws off white hot sparks and globules, consisting of the protoxyd of iron. When sulphur, phosphorus, or charcoal, are burned in oxygen, the

combustion is intensely vivid, and *acids* are formed by the union of the two bodies. This circumstance induced the French chemists to introduce the term *oxygen* (from $\sigma\gamma\gamma\epsilon\iota$), and they regarded it as a necessary component part of all acids; but the extension of experiment has shewn that this is far from true; and in many instances the absorption of oxygen gives rise to alkaline and earthy products, so that the term is very objectionable.

Conceiving that so powerful a supporter of combustion as this gas must in itself contain little or no phlogiston, Dr. Priestley termed it *dephlogisticated air*. See COMBUSTION.

The French theorists considered oxygen as necessarily present in all cases of combustion, under which article will be found a detailed account of the subject; but experiment does not support the conclusion, and there are abundant instances of combustion, not merely where no oxygen gas is present, but where solids and fluids act upon each other, independent of the absorption or decomposition of any aeriform matter. See OXYMURIATIC Gas.

Oxygen gas is very sparingly absorbed by water; when that fluid has been deprived, by boiling, of the atmospheric air which it contains, it takes up $\frac{1}{27}$ th its bulk of oxygen, at the temperature of 60°.

If the number representing oxygen be deduced from the analysis of water, (see HYDROGEN and WATER,) it will be 7.5, for that fluid is composed of one volume of hydrogen and half a volume of oxygen, and the weights of equal volumes of these gases are to each other as 1 to 15. Or if, to obviate the use of fractional parts, we regard water as composed of two proportions of hydrogen, and one of oxygen, the symbol of the latter gas will be 15; and water composed of 15 oxygen + 2 hydrogen, will be represented by the number 17, instead of 8.5, as in the former instance. B.

OXYGENATION, in *Agriculture*, the act of uniting oxygen with different substances; when it is combined with earthy materials, such as mould, clay, &c. they are found from experience to be more proper for the nutrition and support of different sorts of vegetables as crops.

OXYGLUCA, a word used by the ancients to express a liquor made of a mixture of honey, water, and vinegar. The common way of making it was by macerating the combs, after the honey was pressed out, in water; and then adding a small portion of vinegar, to give it a tartness. It was sometimes made without the addition of the acid, and made a weaker sort of mead, used as a common drink in hot weather. Galen says it was the same with the *apomeli*.

OXYGONIUS, OXYGONOUS, formed of $\sigma\gamma\gamma\epsilon\iota$, and $\gamma\omega\nu\eta$, angle, in *Geometry*, acute-angled; a figure, consisting wholly of acute angles, or angles less than ninety degrees.

The word is chiefly applied to triangles, where the three angles are all acute, or less than ninety degrees each.

OXYLIPES, a word used by some authors as a name for bread, which has a mixture of vinegar in it; intended sometimes for eating, sometimes for medicinal uses.

OXYLOBIUM, in *Botany*, from $\sigma\gamma\gamma\epsilon\iota$, sharp, and $\lambda\omicron\beta\omicron\varsigma$, a pod or legume, alluding to the sharp point or beak of that part. Andr. Repos. 492. Brown in Ait. Hort. Kew. v. 3. 9. Class and order, *Decandria Monogynia*. Nat. Ord. *Papilionaceae*, Linn. *Leguminosae*, Juss.

Gen. Ch. Cal. Perianth inferior, somewhat two-lipped, in five deep segments, without appendages; the three lower ones rather most deeply separated. Cor. papilionaceous, of five petals; standard roundish, broad, with a short claw; wings obovate, a little shorter than the standard, oblique at the base, with short, linear claws; keel compressed, as long

as the wings, of two heart-shaped petals cohering at their summits, with two short, linear, distinct claws. *Stam.* Filaments ten, awl-shaped, ascending, all enclosed in the keel; anthers roundish. *Pist.* Germen ovate; style awl-shaped, ascending, permanent and finally hardened; stigma simple. *Peric.* Legume ovate, turgid, acute, of one cell. *Seeds* several, roundish-kidney-shaped, inserted into the margin of each valve at the dorsal suture.

Eff. Ch. Calyx deeply five-cleft, somewhat two-lipped. Corolla papilionaceous; keel compressed, nearly as long as the spreading standard. Style ascending. Stigma simple. Legume ovate, inflated, pointed, of one cell with several seeds.

1. *O. arborescens.* Tall Oxylobium. Ait. n. 1.—Leaves linear-lanceolate. Bractæas permanent, at the top of the flower-stalk. Corymbs dense. Legume scarcely longer than the calyx.—Found by Mr. Brown, in Van Diemen's land; brought to Kew garden in 1805, where it flowers from April to June, and is kept in the greenhouse. The stem is shrubby or arborescent. Nothing further is, as yet, recorded of this species, nor have we ever seen a specimen.

2. *O. ellipticum.* Oval-leaved Oxylobium. Ait. n. 2. (Gompholobium ellipticum; Labillard. Nov. Holl. v. 1. 107. t. 135. Callistachys elliptica; Vent. Malmaï. 115, b. Callistachya elliptica; Sm. Tr. of Linn. Soc. v. 9. 266.)—Leaves elliptic-oblong. Bractæas below the top of the flower-stalk, deciduous. Corymbs dense. Legumes twice the length of the calyx.—Discovered first by the late Mr. David Nelson, in Van Diemen's land, from whence it was brought to Kew by Mr. Brown, in 1805. It is kept in the greenhouse, and flowers most part of the summer. Ventenat, having never seen the fructification, referred the plant by its habit to his *Callistachys*, but proves to be mistaken. We know it only by Mr. Brown's specific character; and the plate and description of Labillardiere, according to whom the stem is shrubby, nine feet high, with upright silky branches that are sometimes whorled. Leaves imperfectly whorled, near an inch long, on short stalks, elliptical, entire, revolute, silky beneath, tipped with a small point. Stipulas none. Flowers numerous, in dense, short, silky corymbs. We presume the corolla is yellow, but Labillardiere, having described from his dried specimens only, generally omits that particular. The legume is clothed with dense, twisted, yellowish hairs, which are very sensible hygrometers.

3. *O. cordifolium.* Heart-leaved Oxylobium. Andr. Repof. t. 492. Curt. Mag. t. 1544. Ait. n. 3.—Leaves ovate, somewhat heart-shaped, loosely hairy. Umbels terminal, sessile, of few flowers. Discovered in New South Wales, by the right honourable sir Joseph Banks, in the course of his celebrated voyage. Seeds were imported by Mr. Loddige, who raised plants from them about 1804 or 1807. This shrub is kept in the greenhouse, and blossoms throughout the summer, producing plenty of seeds, by which, or by cuttings, it is readily increased. It is of humble growth, with numerous, partly whorled, round, hairy, purplish, leafy branches. Leaves three in a whorl, rarely opposite or solitary, nearly sessile, scarcely half an inch long, broad-ovate or somewhat heart-shaped, acute, revolute, entire; paler beneath; very rough at the edges, and hairy all over in some degree. Flowers of a rich deep orange, verging towards scarlet, from three to six in each clove terminal umbel. Standard marked with a yellow spot, and a deep red curved line, at its base. Seeds about five, black, clouded.

OXYMEL, οξύμελι, formed from οξύς, *four*, and μέλι, *mel*, *honey*, in *Pharmacy*, a mixture of honey and vinegar boiled to the consistence of a syrup.

OXYMEL, *Simple*, is composed of two pounds of clarified honey, and a pint (lb.) of acetic acid (distilled vinegar), boiled in a glass vessel by a gentle heat into the consistence of a syrup.

Simple oxymel in doses of fʒj, or more, dissolved in barley water, forms a pleasant and cooling beverage in fevers and inflammatory affections. It is often added to gargles in cynanche tonsillaris, and is a common article of other remedies in catarrhal complaints. The Dublin college orders it to be prepared with unclarified honey, skimming it during the boiling; but the London directions are to be preferred.

OXYMEL *Colchicum of Storck.* (See COLCHICUM.) It is observable, that the active matter of the colchicum is apt to be injured by the boiling; and hence this preparation is very uncertain, with regard to its strength. It is given in humoral asthma, and in dropsies. The dose is fʒj, gradually increased, to fʒj, given in a cupful of gruel, twice a day.

OXYMEL *Scilla*, oxymel of squills, is prepared by boiling three pounds of clarified honey in two pints (pounds) of vinegar of squill in a glass vessel, over a gentle fire, to a proper consistence. This is principally employed as an expectorant, and as such, is very useful in humoral asthma, and chronic coughs, in doses from fʒss to fʒij. It is generally given in some aromatic distilled water, to prevent the nausea which it is apt to induce; in large doses it is given to excite vomiting, and at the same time to clear the chest, in hooping-cough.

OXYMEL *Æruginis*, oxymel of verdigris, consists, according to the Dublin college, of the following ingredients, *viz.* prepared verdigris, one ounce; wine vinegar, seven fluid ounces; and clarified honey, fourteen ounces. Dissolve the verdigris in the vinegar, and strain it through a linen cloth; add the honey, and boil the mixture to a proper thickness. This preparation is detergent and escharotic. In the above state it is used for taking down fungous flesh; and considerably diluted, it is an useful stimulant to foul ulcers, which it clears, and excites to a more healthy action. It has been employed as a gargle in venereal ulcerations of the mouth and fauces; but, Mr. Thomson says, we cannot recommend it.

OXYMORON, or *seeming contradiction*, in *Rhetoric*, is a species of antithesis, when the parts of a sentence disagree in sound, but are consistent in sense. Thus Ovid, lib. viii. ver. 47, says of Althea, *impiegate pia est*.

OXYMURIATIC Acid Gas, French nomenclature; Dephlogisticated muriatic acid gas of Scheele; Chlorine, or Chloric gas, of sir H. Davy.

The substance which has received these various names was discovered in the year 1774, by the illustrious Scheele, and regarding it as muriatic acid deprived of hydrogen, he gave it the name of dephlogisticated marine acid.

In the year 1785, Berthollet published a series of experiments upon the same subject, from the results of which he drew inferences very opposite to those of Scheele; for instead of regarding it with his predecessor as an elementary body, and as the basis of muriatic acid, he was induced to consider the muriatic acid as a simple form of matter, and to conclude that the dephlogisticated muriatic acid gas of Scheele consisted of muriatic acid in combination with oxygen, whence the term oxymuriatic acid gas.

Berthollet's experiments appeared so satisfactory, and his results so conclusive, as to lead to the general adoption of his opinions by the chemists of Europe; but in the year 1810, sir Humphrey Davy presented the Royal Society with a paper, entitled "Researches on the Oxymuriatic Acid, its Nature and Combinations, &c." (see Phil. Transf. 1810, page 231.) in which, after quoting the opinions of the authors alluded to, and of other experimentalists, he details a series

a series of investigations which demonstrate the inaccuracy of Berthollet's views, and in a great measure re-establish the correctness of those of Scheele: these will be noticed in due order, and the reasons stated which induced sir H. Davy to give to the subject of this article the name of *Chlorine*.

Many objections have been started to this revival of the Scheelian doctrine by the advocates of the French school, but they are hypothetical not experimental, and to meddle with ephemeral controversialists is below the dignity of a Cyclopædia, which aims at the exalted task of recording the truths of science, and of transmitting to posterity the successful instruments of its progress.

Chlorine may readily be procured by heating in a glass retort a mixture of equal weights of the black oxyd of manganese and common muriatic acid, (spirit of salt.) The gas is soon liberated, and may be conveniently collected over warm water. In this process the oxygen of the oxyd of manganese unites to the hydrogen of the muriatic acid, while the chlorine, the other element of the muriatic acid, is disengaged in the pure and gaseous form. The correctness of this view may be demonstrated by a more refined experiment. Introduce into a glass retort, supplied with a stop-cock, a small quantity of black oxyd of manganese, exhaust the retort by means of an air-pump, and fill it with pure muriatic acid gas. If a gentle heat be now applied, a decomposition of the gas, and a partial decomposition of the oxyd of manganese, will be effected; the hydrogen of the former, combining with a portion of the oxygen of the latter, produces water, which collects in drops in the cool part of the retort, and a quantity of chlorine, equal to one-half of the volume of muriatic acid decomposed, is liberated. By such decomposition of the muriatic acid gas, the proportion of its elements may be accurately ascertained. Thus, if the number 1 be employed to represent hydrogen, 33.5 will be the symbol for chlorine, and 34.5 (i. e. $1 + 33.5$) for the muriatic acid, these numbers representing the respective elements *by weight*. The synthetic demonstration consists in detonating, by the electric spark, one volume of chlorine with one of hydrogen; they combine without change of bulk, and two volumes of muriatic acid gas are produced.

Another mode of procuring chlorine consists in distilling a mixture of about eight parts of decrepitated common salt, three parts of black oxyd of manganese, and five parts of sulphuric acid diluted with half its weight of water. In this case the sulphuric acid, which consists of sulphur, oxygen, and water, decomposes the marine salt, consisting of sodium and chlorine: the sodium is oxydized at the expense of the water of the acid, the hydrogen of which unites to the chlorine of the salt, and produces muriatic acid, which is in its turn decomposed by the oxyd of manganese as above described.

Although chlorine can only be conveniently collected in the hydro-pneumatic apparatus, yet as it is slowly absorbed by water it cannot be retained in contact with that fluid, and should therefore be preserved in bottles with ground glass stoppers.

Chlorine has the following properties:

Its colour is, as its name imports, (from *χλωρος*) greenish-yellow.

It has a peculiar suffocating odour, and when respired is instantly fatal: even when largely diluted with atmospheric air it produces highly deleterious effects, such as cough, catarrhal affection, and great irritation of the lungs. There are circumstances which render much caution necessary in collecting and examining the gas.

One hundred cubic inches of chlorine, at a mean temperature and pressure, weigh 76 grains. At the temperature of

60° Fahrenheit, one volume of water dissolves about two of chlorine: the solution has the odour and colour of the gas: its taste is nauseous and astringent. By means of Wolfe's apparatus water may be conveniently saturated with this gas: the contents of the first bottle should be rejected as containing a portion of muriatic acid, which passes over during the distillation.

When a burning wax taper is plunged into a bottle of chlorine, the brilliancy of its flame is greatly impaired; it exhibits a dull red light, and throws off a large quantity of charcoal.

The attraction of chlorine for the metals is in most instances extremely energetic: when copper leaf, or antimony, or arsenic in powder, are thrown into the gas, they immediately enter into vivid combustion and form binary compounds, and if the oxyds of these and many other metals be heated in chlorine, oxygen is expelled, and similar compounds of the metal and chlorine result.

Upon the French theory of combustion, oxygen is absolutely necessary to the phenomena (see COMBUSTION), but here are instances of brilliant inflammation without the presence of that body. Other cases might be adduced, such as the combustion which ensues when copper filings and sulphur are heated together in an exhausted vessel; or when potassium and arsenic are made to combine under similar circumstances.

Combustion, therefore, is to be regarded as the general result of the exertion of powerful chemical attraction, and not as dependent upon any peculiar substance, or as resulting from the decomposition of any distinct form of matter.

When sulphur is heated in chlorine the two bodies readily combine, and form a peculiar compound, which was first described by Dr. Thomson of Edinburgh. See SULPHUR.

When phosphorus is introduced into chlorine, it spontaneously ignites and burns with a pale yellowish flame, producing a white volatile substance, composed of two proportions of chlorine and one of phosphorus. There is also a compound of phosphorus and chlorine composed of one proportion of each of its elements, and consequently containing only half as much chlorine as the former. It may be obtained by distilling in a close vessel a mixture of corrosive sublimate and phosphorus. It is a limpid liquor, which emits acid fumes when exposed to air. See PHOSPHORUS.

For our knowledge of these compounds, and of their singular properties, we are indebted to the experimental industry of sir H. Davy.

Charcoal and chlorine have not hitherto been combined. If a piece of charcoal be ignited to whiteness by means of the Voltaic battery, in a vessel of chlorine, there is no mutual action: the colour of the gas remains unimpaired, and the charcoal unaltered: no carbonic acid is formed.

This circumstance first led sir H. Davy to doubt the accuracy of Berthollet's investigation, and to undertake the series of inquiries concerning the nature and properties of chlorine, which have been alluded to. Chlorine, or oxy-muriatic acid gas of the French nomenclature, was supposed to contain oxygen in a very loose state of combination, an idea sufficiently disproved by the experiment just related; and whenever oxygen appears to be procured, it is derived either from water or some other source. Neither intense ignition, nor excessive cold, produce any change in chlorine. It has usually been stated to solidify at the temperature of freezing water; but if the gas be carefully dried, no solid matter is deposited. The concentrated aqueous solution freezes at 40°.

When no moisture is present, chlorine effects no change upon vegetable colours; but if the gas has not been very carefully dried by exposure to muriate of lime, or if the coloured

coloured substance introduced into it is the least damp, it fades, and acquires a yellow tint, and almost all coloured solutions suffer the same change. This remarkable effect, which has generally been regarded as arising from the communication of oxygen to the colouring matter by the chlorine, seems to depend upon more intricate changes; it is perhaps connected with the production of muriatic acid and of oxygen, in consequence of the action of chlorine upon water.

The uses of chlorine in the art of *bleaching*, and the peculiar modes of its application, have already been described, (see BLEACHING.) Mr. Watt of Birmingham, and Mr. Henry of Manchester, are intitled to the merit of having first introduced this new method of bleaching into England. It originated with Berthollet.

In the year 1811, sir H. Davy discovered a gaseous compound of chlorine and oxygen; its colour is more intense than that of chlorine, a circumstance which induced him to call it *euchlorine*, from *eu* and *χλωρος*. To obtain this gas, some oxymuriate of potash should be introduced into a very small glass retort, and a mixture of equal parts of muriatic acid and water poured upon it. Twenty grains of the crystallized oxymuriate to half an ounce of the dilute acid, are good proportions. On the cautious application of a very gentle heat, the *euchlorine* passes over, and must be collected in the mercurio-pneumatic apparatus.

The smell of this gas differs from, and is much less disagreeable than, that of chlorine. It is unrespirable. Water takes up eight times its volume of *euchlorine*, and forms a lemon yellow solution. Its weight, compared with that of hydrogen, is as 33 to 1. One hundred cubic inches weigh 75 grains.

When *euchlorine* is heated to a temperature between 100° and 150° it expands with explosion, and is resolved into its constituent parts, *viz.* two volumes of chlorine and one of oxygen. It exerts no action upon those metals which inflame in, and energetically combine with, chlorine. If copper leaf, for instance, be introduced into pure *euchlorine*, it is not even tarnished, but if heat be applied so as to decompose the gas, the metal is instantly ignited, and burns as in a mixture of two parts of chlorine and one of oxygen. Phosphorus, an inflamed taper, and sulphur in a state of combustion, immediately decompose *euchlorine*, and exhibit the same phenomena as when burned in an artificial mixture of its elementary gases.

The above mentioned experiments and others, shew that *euchlorine* is composed of one proportion of oxygen = 7.5, and one of chlorine = 33.5, and consequently its representative symbol is 41.

In this article the term chlorine has been preferred to that of oxymuriatic acid, not merely on account of its brevity and propriety, but as founded upon an obvious and unalterable character of the body it represents, namely, its colour; and a change of nomenclature became absolutely necessary to the systematic writer; for it would in him be absurd to call a body *oxymuriatic acid*, which exhibits no acid characters, and in which neither oxygen nor muriatic acid have hitherto been demonstrated to exist. B.

The editor of the Cyclopædia is fully apprized of the importance of giving accurate details of the origin and progress of every art and science that are comprehended within the limits of the multifarious work in which he is engaged; and of doing ample justice to those ingenious men, whose only recompence for valuable discoveries is, in most cases, the reputation which they thus acquire. It is, therefore, without hesitation, that he complies with the wishes of a friend, no less respected and esteemed for his eminent attain-

ments in science, than for his general character, by supplying the defects and correcting the errors which he has pointed out to him in the article BLEACHING. He much regrets that the name of Mr. Henry, of Manchester, whom he has long known and honoured, and the part which he took in the improvement of this branch of our manufactures, should not have been noticed by the ingenious compiler of that article. Avoiding every thing that may be likely to produce personal animosity and altercation, the editor thinks it most advisable to content himself with giving a fair and full statement of Mr. Henry's claims, and this shall be done as nearly as possible in the words of his correspondent, Dr. W. Henry. He begins with alleging, that the writer of the article above-mentioned, "in assigning to different persons their shares of merit, in the introduction of the new mode of bleaching by oxymuriatic acid and its compounds, has made a distribution, which is very far from being fair or equitable." "Of the part," he says, "taken by Mr. Watt of Birmingham, in the application of this most important discovery, much too little is said; and of my father's share in the improvement, which was both an early, an active, and an expensive one, not the smallest notice is taken throughout the whole article; though it was a matter of too much notoriety to have escaped the knowledge of any person in this neighbourhood."—"The fact is, that next to Mr. Watt, who had very early a personal communication with Mr. Berthollet on the subject, (see *Annales de Chimie*, ii. 160.), and who appears to have made the first experiments that were attempted in this country, my father was at least equally early with any other person."—"It happens, fortunately for the establishment of the claim of Mr. Watt and my father, that I am in possession of a series of letters from the former to the latter, communicating unreservedly, in return for similar information, what he was doing with a view to the practical application of Berthollet's discovery. In one of these letters (Feb. 23 1788) Mr. Watt states, that at that very time 1500 yards of linen "were bleaching" by the new process under his directions. In the same letter he alludes to "an advertisement calling a meeting of the Manchester manufacturers and merchants to consider of a petition presented by certain foreigners — to parliament, concerning a certain liquor made from native salt; which whitens linen, &c. in a shorter time, and without many inconveniences and losses, to which the old method was liable."

Dr. Henry further states, that the piece of calico, said, in the article of BLEACHING, to have been bleached by the new process in the spring of 1788, was bleached immediately before the meeting to which Mr. Watt alludes in the fore-cited letter, and half a piece was produced at the meeting, in order to furnish a reason for resisting the above-mentioned application of the foreigners. But, "there is every probability," says Dr. H., "that before this was done, the 1500 yards bleaching under Mr. Watt's instructions, must have been finished; and that, consequently, that distinguished philosopher had the priority to Messrs. Cooper, Baker, and Taylor. But, however this may be, my father, at the same public meeting where Mr. Cooper shewed his specimen, produced, not half a piece, but half a yard, of calico, bleached by the oxymuriatic acid. What was wanting in quantity, however, was made up in the quality of the work; for the specimen was declared to be superior to Mr. Cooper's in whiteness; and its superiority led to an acquaintance between my father and one of the bleachers present, who concurred in this opinion, and to the introduction of this gentleman (Mr. Ridgway of Harwich) by my father in the new mode of bleaching."

Mr. Cooper, it is said, established a large bleaching concern,

cern, which failed; and Mr. Henry's, on a smaller scale, was relinquished in consequence of the dishonourable conduct of a partner.

The event of the town's meeting, already mentioned, was, "that in consequence of the facts, which were stated on the authority of Mr. Watt, Mr. Cooper, and my father, instructions were given to the members of parliament for the county to oppose the petition; and its prayer was accordingly refused." Afterwards, when application was made for a patent, Mr. Henry drew up a memorial, which was presented to the attorney-general against the claim of the petitioners, and which contributed, at least in a considerable degree, to their want of success. This document, which is still preserved, places beyond all controversy Mr. Henry's right to rank among the first improvers of the process of bleaching.

It ought also to be mentioned that the first thing attempted by Mr. Henry was "an establishment for preparing bleaching liquor, and selling it to consumers. This liquor was prepared by receiving the oxymuriatic acid gas into a solution of caustic potash. It was soon found, however, that the liquor, though very good at first, lost its power by keeping, in consequence of the decomposition of the acid, on a principle since explained by Mr. Chenevix, and the formation of hyper-oxymuriate and common muriate of potash. It was by disappointment from this cause (an effete liquor having been sent to Mr. Hoyle and others) that my father was influenced to take up the business of bleaching, in which he would probably have continued till this day, had it not been for the dishonourable conduct of his partner."

After the preceding statement, the editor thinks himself warranted, both in justice and honour, to recommend the following insertions in the article of BLEACHING. At the close of the 11th line of col. 2. p. 5. of that article, viz. before any considerable bleaching work was established in France, let the following sentence be introduced. "A very early and active share was taken also in the introduction of the new mode of bleaching by Mr. Henry of Manchester and Mr. Watt of Birmingham. The latter gentleman, (who had been present at some experiments of Berthollet on the bleaching power of oxymuriatic acid,) in the month of February 1788 actually whitened 1500 yards of linen by this method. To his exertions, and to those of Mr. Henry, who extended the scale of his operations from small experiments to a regular establishment for the purpose, and to the co-operation of the principal manufacturers of Manchester, it was owing, that some foreigners, who had brought with them into this country the knowledge of Berthollet's process, were prevented from obtaining an exclusive and most injurious monopoly."

The editor also requests that the paragraph in line 27. p. 6. may be altered and read as follows: "One of the first of these successful institutions for alkali, invented by Mr. Henry of Manchester, and practised, under his instructions, by the bleachers of cotton hose at Nottingham, was," &c. &c. and let the paragraph terminate with the words "and enabled the persons to let the goods down into the fluid."

OXYOPIA, from *ὄξύς*, sharp, and *ὄψις*, vision, in Surgery, a peculiar acuteness of sight, sometimes observed in fair persons.

OXYPETALUM, in Botany, from *ὄξύς*, sharp, and *πέταλον*, a petal, Brown in Tr. of the Wernerian Soc. v. 1. 41. Class and order, *Pentandria Digynia*. Nat. Ord. *Contortæ*, Linn. *Apocynæ*, Juss. *Asclepiadæ*, Brown.

Ess. Ch. Corolla with a short inflated tube; the limb in five deep segments, each with a ligulate appendage above. Crown of the stamens of five roundish, simple, fleshy leaves.

Anthers tipped with a membrane. Masses of pollen linear, pendulous, attached to the curvature of the processes, which are subsequently turned upwards. Stigma with an elongated, deeply divided point. Follicles . . .

1. O. *fragrans*. The only species, discovered by Sir Joseph Banks, in 1768, near Rio de Janeiro. This is a twining shrub, with opposite heart-shaped leaves. Umbels between the footstalks, somewhat corymbose. Flowers sweet-scented.

OXYPHLEGMASIA, from *ὄξύς*, and *φλεγω*, to burn, in Surgery, a very severe inflammation.

OXYPYCNI, *ὀξυπυκνί*, in the ancient Greek Music, was a name given to such chords as formed the highest sounds of the spiffa. There were five oxypycni in the scale. See PYCNI and SPISSUM.

OXYREGMIA, *ὀξυρῆμις*, formed from *ὄξύς*, and *ρεῖν*, to run, in Medicine, a sourness of the stomach-liquor, occasioning acid belches. See RUCTATION.

OXYRINCHITES, in Ancient Geography, a nome of Egypt, in Heptanomia, to the left of the Nile, on the borders of Libya.

OXYRINCHUS, a town of Egypt, the capital of the preceding nome, which took its name from a fish, called by the Greeks *ὀξυρύνχος*, oxyrinchus, which was an object of worship to the Egyptians, and which had a temple in this nome. This city became episcopal, and was much celebrated in the earlier ages of the church. Baillet says, that it contained 20,000 nuns and 10,000 monks, whence we may infer that the remaining population was very numerous, but this establishment contributed, in process of time, to the diminution of the inhabitants, and the decline of the place. Nothing remains of this city, in the village called Benefech, built on its ruins, but some fragments of stone pillars, marble columns in the mosques, and a single column left standing, along with its capital, and parts of the entablature, which shew that it is the fragment of a portico of the Composite order. Thus, Oxyrinchus, once a metropolis, surrounded by a fertile plain, two leagues off the Libyan range of hills, has disappeared beneath the sand; and the new town has been obliged to retreat from this desolating invasion, leaving to its ravages house after house; and the inhabitants must at last be driven beyond the canal Jusuf, on the border of which they will be still menaced. Denon's Travels in Egypt, vol. i.

OXYRRHODON, OXYRRHODINUM, composed of *ὄξύς*, sour, and *ῥόδον*, rose, a mixture of two parts of oil of roses, and one part of vinegar, stirred together for some time.

To these are sometimes added distilled waters. It is used for inflammations, and to dry up tetter.

Scultetus prescribes it as follows: two whites of eggs beaten, one ounce and a half of vinegar of roses, four ounces of rose-water, and two ounces of oil of roses.

OXYRYNCHUS, in Ichthyology, a species of Raja, which see.

OXYS, in Botany, *ὄξύς*, sharp or acrid, see OXALIS.

OXYSACCHARUM, *ὀξύσακχαρον*, compounded of *ὄξύς*, sour, and *σακχαρον*, sugar, a liquid medicine, composed of sugar and vinegar.

The name is more peculiarly given to a syrup prepared with vinegar, the juice of four pomegranates and sugar; used to cool, refresh, and resist the malignity of peccant humours.

OXYSAL DIAPHORETICUM, the name of a compound medicine greatly recommended by several authors, and invented by Angelus Sala. The manner of preparing it is this: take fine salt of carduus benedictus, put it into an earthen pot, and pour upon it gradually some strong wine-

Vinegar,

vinegar, or spirit of sugar; continue to pour this on till the ebullition ceases, and an agreeable smell arises, and the matter has an agreeable, though somewhat acid, taste; let all the humidity from this mixture be evaporated over a gentle heat; and after this, let all the salt be again dissolved in water, and set in digestion in balneo Mariæ for eight days: a liquor of a beautiful and pellucid colour is there produced, which, when poured carefully off into another vessel, is to be again evaporated to a dryness with a very gentle heat, and the remaining matter, which is the salt, is to be collected together, and kept in a phial carefully stopp'd; for it is subject to run, if left to the access of the air, like the common alkali salt.

OXYSTELMA, in *Botany*, so named by Mr. Brown, from οξύς, *sharp*, and στελμα, the same as στεμμα, *a crown*; Brown in Tr. of the Wernerian Soc. v. 1. 40. Prodr. Nov. Holl. v. 1. 462. Class and order, *Pentandria Monogynia*. Nat. Ord. *Contortæ*, Linn. *Apocynæ*, Juss. *Asclepiadææ*, Brown.

Eff. Ch. Corolla wheel-shaped, spreading. Column prominent. Crown of the stamens of five compressed, acute, undivided leaves. Anthers tipped with a membrane. Masses of pollen compressed, attached by their taper points, pendulous. Stigma pointless. Follicles smooth. Seeds comose.

1. *O. esculentum*. (*Periploca esculenta*; Linn. Suppl. 168. Roxb. Coromand. v. 1. 13. t. 11. Willd. Sp. Pl. v. 1. 1250. *Apocynum maderaspatanum angustifolium* scandens, flore amplo gemello versicolore; Pluk. Amalth. 19. t. 159. f. 6, bad.)—Leaves linear-lanceolate. Segments of the corolla triangular.—Native of bushy places, near rivers and pools, in Ceylon and Malabar. Koenig, who sent fine specimens to Linnæus, has written on one of them that "the plant is esculent, and called *Usepale* in the Tamul language." Dr. Roxburgh could not find that it was eaten by the people, at least of the Malabar coast. He gives *Oudy-palla* as its name among the Telingas, and remarks that cattle eat it. The root is fibrous, and perennial as well as the twining, slender, smooth, round, branching stems. The leaves and flowers are produced during the rainy season; the former are opposite, stalked, above two inches long, linear-lanceolate, acute, entire, smooth, single-ribbed, light green, rounded at the base, deciduous. Clusters long, lax, stalked, lateral, solitary, between the leaf-stalks at one side. Flowers the size of those of *Primula Auricula*, of some of whose most beautiful varieties they give no very remote idea, but their segments are much more acute. Their colour is a pale blush, with crimson veins, a purple eye, and a mixture of green and white in the centre.

2. *O. carnosum*. Brown Prodr. Nov. Holl. v. 1. 462.—Leaves nearly oval, pointed. Segments of the corolla linear.—Native of the tropical part of New Holland, where it was observed by Mr. Brown. The stems are twining, herbaceous. Leaves fleshy, smooth, opposite. Flowers in umbellate stalked clusters, from between the leaf-stalks. Mr. Brown remarks that this New Holland species is so very different from the East Indian one, he is inclined to think they ought to be different genera.

OXYTOCHIA, formed of οξύς, *sharp*, and τιττω, *I bring forth*, in *Medicine*, a term used by many authors to express such medicines as are given to promote delivery.

OYACACHA, in *Geography*, a town of South America, in the province of Quito; 25 miles E. of Quito.

OYAMBRE, CAPE, a cape on the N. coast of Spain. N. lat. 43° 25'. W. long. 4° 17'.

OYAPOOK, a river of Guiana, which runs into the Atlantic, near cape Orange,

OYE, a town of France, in the department of the straits of Calais, situated on a branch of the river Aa, to which it gives name, formerly in possession of the English; seven miles E.N.E. of Calais.

OYE, *Norder* and *Sander*, two small islands of Denmark, in the North sea, two and three miles N. of Nordstrand.

OYER, a town of Norway; 88 miles N. of Christiania.

OYER seems to have been anciently used for what we call *assizes*.

OYER and *terminer*, a commission directed to the judges and other gentlemen of the county to which it is issued, by virtue whereof they are empowered to hear and determine treasons, and all manner of felonies and trespasses. However, the judges or sergeants at law only are of the *quorum*, so that the rest cannot act without the presence of one of them. The term is French, and literally denotes to hear and determine. In our statutes it is sometimes written *oyer and determiner*. This is the first and largest of the five commissions by which our judges of assize do sit, in their several circuits. (See *Assizes*.) The words of the commission are "to inquire, hear, and determine;" so that by virtue of this commission they can only proceed upon an indictment found at the same assizes, for they must first inquire, by means of the grand jury or inquest, before they are empowered to hear and determine by the help of the petit jury. Therefore they have another commission of "gaol-delivery," which empowers them to try and deliver every prisoner, who shall be in the gaol when the judges arrive at the circuit town, whenever, or before whomsoever indicted, or for whatever crime committed. Thus, one way or other, the gaols are in general cleared, and all offenders tried, punished, or delivered, twice in every year. Sometimes also, upon urgent occasions, the king issues a special or extraordinary commission of oyer and terminer, and gaol-delivery, confined to those offences, which stand in need of immediate inquiry and punishment; upon which the course of proceeding is much the same, as upon general and ordinary commissions. Formerly it was held, in pursuance of the statutes 8 Ric. II. c. 2. and 33 Henry VIII. c. 4. that no judge or other lawyer could act, in the commission of oyer and terminer, or in that of gaol-delivery, within his own county, where he was born or inhabited; in like manner as they are prohibited from being judges of assize and determining civil causes. But that local partiality, which the jealousy of our ancestors was careful to prevent, being judged less likely to operate in the trial of crimes and misdemeanors, than in matters of property, and disputes between party and party, it was thought proper by the statute 12 Geo. II. c. 27. to allow any man to be a justice of oyer and terminer, and general gaol-delivery, within any county of England.

Anciently it was only in use upon some sudden outrage, or insurrection, in any place.

OYER *de Record* is a petition made in court, praying that the judges, for better proof-sake, will be pleased to hear, or look upon, any record.

In the like sense, a person may demand *oyer* of a bond, deed, covenant, or the like.

O YES, a corruption of the French *oyez*, *hear ye*, being a term, or formula, wherein the criers in our courts enjoin silence or attention, before they make proclamation of any thing.

OYL CREEK, in *Geography*, a river of Pennsylvania, which runs into the Allegany, N. lat. 41° 26'. W. long. 72° 43'.

OYON, a town of Spain, in the province of Alava; 22 miles S.S.E. of Vittoria.

OYONNEZ, a town of France, in the department of the Ain, and chief place of a canton, in the district of Nantua;

Nantua; seven miles N. of Nantua. The place contains 1178, and the canton 7278 inhabitants, on a territory of 207½ kilometres, in 11 communes.

OYSTER, in *Natural History*. See OSTREA.

Oysters in their growth become fastened to every solid substance which they happen to come into contact with; and rocks, small stones, wood, sea-plants, and a thousand other things, are found at times with oysters adhering to them, whose shells have fitted themselves to the form of the thing itself, and lost their natural shape. The people who fish for, and trade in oysters, pretend to distinguish two kinds; one which is fecund, and will breed; the other, which is barren. They say, they distinguish these by a little black fringe, which always surrounds the good breeding oysters.

The way to make oysters green is, to put them into small pits where the water is about three feet deep, in the salt marshes, and where the sun has great power; in these they become green in three or four days.

The oyster affords the curious in microscopic observations a very pleasing entertainment. In the clear liquor many little round living animalcules have been found, whose bodies being conjoined, form spherical figures, with tails not changing their place otherwise than by sinking to the bottom, as being heavier than the fluid; these have been seen frequently separating, and then coming together again. In other oysters, animalcules of the same kind were found, not conjoined, but swimming by one another, whence they seemed in a more perfect state, and were judged by Mr. Leewenhoeck to be the animalcules in the roe or semen of the oyster.

A female oyster being opened, incredible multitudes of small embryo oysters were seen, covered with little shells, perfectly transparent, and swimming along slowly in the liquor; and in another female the young ones were found of a browner colour, and without any appearance of life or motion.

Monfieur Joblot also kept the water running from oysters three days, and it appeared full of young oysters swimming about nimbly in it; these increased in size daily, but a mixture of wine, or the vapour of vinegar, killed them.

In the month of August oysters are supposed to breed, because young ones are then found in them. Mr. Leewenhoeck, on the fourth of August, opened an oyster, and took out of it a prodigious number of minute oysters, all alive, and swimming nimbly about in the liquor, by means of certain exceeding small organs, extending a little way beyond their shells; and these he calls their beards. In these little oysters he could discover the joinings of the shells, and perceived that there were some dead ones, with their shells gaping. These, though so extremely minute, are seen to be like the large oysters in form.

As to the size of them, he computes, that a hundred and twenty of them in a row would extend an inch; and, consequently, that a globular body, whose diameter is an inch, would, if they were also round, be equal to a million seven hundred and twenty-eight thousand of them. He likewise found animalcules in the liquor five hundred times less than the embryo oysters. Leewenhoeck, *Arcan. Nat. tom. iv. p. 513*.

It is not very uncommon to see on oyster-shells, when in a dark place, a shining matter or blueish light, like a flame of brimstone, which sticks to the fingers when touched, and continues shining and giving light for a considerable time, though without any sensible heat. This shining matter being examined with a microscope, was found to consist of three different sorts of animalcules. *Phil. Trans. N° 279*. See OYSTER-worm, *infra*.

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From another account, preserved in Sprat's History of the Royal Society, from p. 307 to 309, we learn that the oysters cast their spawn, which the dredgers call their spat, in the month of May; this spat cleaves to stones, old oyster-shells, pieces of wood, &c. at the bottom of the sea, which they call cultch; and it is conjectured, that the spat in twenty-four hours begins to have a shell. In the month of May, the dredgers, by the law of the admiralty court, have liberty to take every kind of oyster, whatsoever be their size. When they have taken them, they gently raise with a knife the small brood from the cultch, and then they throw the cultch in again, to preserve the ground for the future, unless they be so newly spat, that they cannot be safely severed from the cultch: in this case they are permitted to take the stone or shell, &c. which the spat is upon, one shell having often twenty spats. After the month of May, it is felony to carry away the cultch, and punishable to take any other oysters, except those of the size of a half-crown piece; or such as, when the two shells are shut, will admit of a shilling to rattle between them. This brood, and other oysters, are carried to creeks of the sea, and thrown into the channel, which are called their beds or layers, where they grow and fatten; and in two or three years the smallest brood will become oysters of the foresaid size. There are great penalties, imposed by the admiralty court, upon those that fish out of the grounds which the court appoints, or that destroy the cultch, or that take any oysters that are not of the proper size, or that do not destroy a fish, which they call the five-finger, the common sea-star, because that fish gets into the oysters when they gape, and sucks them out. The reason of the penalty for destroying the cultch is, that they find when this is taken away, the ouse will increase, and the muscles and cockles will breed there, and destroy the oysters, because they have no convenience for depositing their spat. The oysters are sick after they have spat; but in June and July they begin to mend, and in August they are perfectly well: the male oyster is black-sick, having a black substance in the fin; and the female white-sick, as they term it, having a milky substance in the fin. Oysters are salt in the pits, salter in the layers, and saltier at sea. It is observed, that when the tide comes in, they lie with their hollow shell downwards, and when it goes out, they turn on the other side; they do not remove from their places, except in cold weather to cover themselves in the ouse.

OYSTER Fishery. See FISHERY.

OYSTERS, *Fossile*. The greatest bed of fossile oysters any where known is that near Reading, in Berkshire. They have the entire shape, figure, and are of the same substance with the recent oyster-shells, and yet must have lain there for a long time, the oldest histories that mention the place giving an account of them. They are extended over no smaller a space than six acres of ground, and just above them there is a large stratum of a greenish loam, called by some writers a green earth, and by others a green sand. It is composed of a crumbly marle, and a very large portion of sand. Under them there is a thick stratum of chalk. They all lie in a level bed, and the strata above the shells are natural, and have never been dug through till the time of finding the shells.

The oyster-shells and green earth together make a stratum of about two feet thick; and over this a much thicker stratum, of a blueish and very brittle clay; but this has never been dug through, except where we find the shells. The people call this *piercy-clay*, and say it is fit for no use. This bed of clay is about a yard deep, and above it is a stratum of fuller's earth, about two feet and a half deep; it is of a very good kind, and is used by the clothiers. Over this there lies a stratum of a fine white sand unmixed either with

the clay or fuller's earth : this is near seven feet deep, and above this there is a stratum of a stiff red clay, of which they make tiles in the place. This is covered with a little vegetable mould, and the depth of this stratum of tile-clay cannot be ascertained, because of the unevenness of the hill.

These oysters are sometimes found whole, but more usually in single shells. When they are in pairs, there is usually some of the green sand found within them : they seldom stick very fast together ; so that unless very carefully taken up, it is not easy to get them in pairs. Phil. Trans. N. 261. p. 484.

OYSTER-Shells. These are an alkali of a more powerful kind than is commonly supposed, and probably are in reality much better medicines than many of the more costly and pompous alkalis of the same class. The proof of alkalis is in their solution by acid spirits ; and Mr. Homberg found, that they dissolved much more easily in the acids of nitre and sea-salt than pearls, coral, and the rest ; which he supposes owing to their containing in the body of the shell a considerable portion of sal-salsus, which is easily perceived upon the tongue, and which keeps the whole substance of the shell in a sort of half-dissolved state. These shells are found to produce very great effects on the stomach, when injured by acid humours ; and Mr. Homberg is of opinion that this their easiness of solution is one great reason of their good effects, and that the quantity of sal-salsus which they contain, contributes not a little towards it, since we are not to look upon that as a mere salt, but a salt of a peculiar kind, formed of sea-salt by the organs of the animal, and the several fermentations it undergoes in the body of it, in the same manner as the nitrous and other salts of the earth cease to be nitrous, &c. as soon as they have been blended with the juices of plants, and form with them a salt peculiar to that plant ; and this is plainly the case in regard to this salt, since it is evidently of a more penetrating taste, and of a different smell, from the salt left by the sea-water between the several external scales, or flakes of the shell.

As oyster-shells were found by Mr. Homberg to be a very valuable medicine, and as one of the common methods of preparing them is by calcination, which he observes cannot but much impair their virtues, he gives the following method of preparing them for taking inwardly, which was what he always used.

Take the hollow shells of the oysters, throwing away the flat ones as not so good ; wash them perfectly clean, and then lay them to dry in the sun : when they appear dry, beat them to pieces in a marble mortar, they will be then found to contain yet a large quantity of moisture ; lay them again in the sun till perfectly dried, and then finish the powdering them, and sift the powder through a fine sieve. Give twenty or thirty grains of this powder every morning, and continue it three weeks or a month. Mem. Acad. Par. 1700.

For the method of calcining oyster-shells, and thus preparing a phosphorus, see *Canton's PHOSPHORUS*.

OYSTER-Worm, in *Natural History*, a name given by writers to a kind of small worm found in oysters, which shines in the dark, in the manner of the glow-worm ; but with an universal light, and not in a peculiar part only.

The first observer of these oyster-worms was M. De La-voye, who communicating his observations to M. Auzout, gave occasion to a very distinct account of them from this author.

The first thing that presents itself, on the opening of the oysters which contain these worms, is only a sort of shining clammy moisture, which appears like a star of a blueish colour, and, being drawn out, will extend itself to near half

an inch long, and shine as much for that whole length as in the contracted state : it will also shine for some time after it is taken out of the oyster.

On a stricter observation, these shining substances are found to be real living worms, and there are indeed three distinct species of them. One sort is whitish, and has twenty-four or twenty-five feet on each side : there is a black speck on one side the head, and the back exactly resembles that of an eel, when the skin is stripped off. The black speck in the head is certainly an eye ; and it is remarkable that the creature has but one. The second sort of these worms is red : this also has but one eye ; its body is made up of several rings ; its nose is like that of a dog, and it has the same number of feet with the former. The third sort is very different from the other two : it is speckled, and its head is like that of a foal, and has a tuft of hair on each side. There are other worms found also in the oyster, particularly a large greyish one, with two horns, a great head, and seven or eight whitish feet ; but these do not shine. This light occurs more frequently in large than in small oysters ; there are few of these large ones that do not yield it in the shells, and in some it is seen in the oysters themselves. Journal de Scavans, 1666.

OYSTER Bay, in *Geography*, a township of New York, situated in Queen's county, Long Island, extending from the sound south to the Atlantic ocean, and including Lloyd's Neck or Queen's village and Hog island. It contains 4548 inhabitants, of whom 134 are slaves.

OYSTER Bay, a harbour for small vessels, in the south-west limits of Barnstable, Massachusetts. It derives its name from its excellent oysters.

OYSTER Creek, a river of North Carolina, which runs into the Atlantic. N. lat. $34^{\circ} 50'$. W. long. $76^{\circ} 45'$.—Also, a river of New Jersey, which runs into the Atlantic, N. lat. $39^{\circ} 44'$. W. long. $74^{\circ} 20'$.

OYSTER Harbour, a bay on the south-west coast of New Holland, and north part of King George the Third's Sound, discovered by captain Vancouver in the year 1791, and so called from its plenty of oysters. It is rendered admissible only for vessels of a middle size, by the shallowness of the water on the bar, extending from shore to shore, on which were found only 17 feet of water, although the depth increased from five to seven fathoms on each side. The deep water within this harbour did not seem to be of any great extent. In both these harbours the communication with the country is rendered unpleasant, by the shallow depth of water extending to a great distance from the shore. If it should be thought an object of importance, this inconvenience might be easily remedied by wharfs. S. lat. $36^{\circ} 58'$. E. long. $118^{\circ} 15'$.

OYSTER Haven, one of the numerous bays on the south-west coast of Ireland, in the county of Cork. The entrance is about two miles eastward of Kinsale harbour. It is seldom frequented, being too near the much superior harbours of Cork and Kinsale ; but there is good shelter for small vessels. M^rKenzie.

OYSTER Island, an island in the bay of Bengal, near the coast of Aracan. N. lat. $20^{\circ} 13'$. E. long. $92^{\circ} 43'$.—Also, a small island in the bay of Sligo, Ireland, between which and the land is the only place in the harbour where a vessel can ride afloat at all hours of the tide. This is distinguished by the name of Oyster island harbour, and has well-sheltered anchorage. M^rKenzie.

OYSTER Island Harbour, a bay or harbour on the Atlantic, on the coast of Massachusetts. N. lat. $41^{\circ} 35'$. W. long. $70^{\circ} 24'$.

OYSTER River, a sandy bay, within the south head of Mercury bay, in New Zealand.

OYSTER River, a branch of the Piscataqua, in New Hampshire.

OYSTERMOUTH, a sea-port and parish in the cwmwd of Gwyr, cantref of Eginoy (now called the hundred of Swansea,) and county of Glamorgan, South Wales, is situated on a small promontory, which forms the western boundary of Swansea bay, in the Bristol channel. The eastern extremity of the parish is called "The Mumble Point," opposite to which, at a short distance from the shore, a light-house has been lately erected. This place might be made an excellent station for shipping at a very trifling expence, either by walling in the sounds between the Mumble Head and the shore, or by running a pier out under the east point of Mumble Hill. Vessels bound for Falmouth with coals from Swansea generally lie here when waiting for wind and convoy; frequently to the number of one hundred and fifty sail at one time. Along the shore hence to Swansea, a railway has been constructed, by which coals and manure are brought down, and lime returned from the limestone quarries, which are situated close to the village of the Mumbles, and where several lime-kilns are established. In digging the stone of these quarries many human bones of large dimensions have been discovered; and tradition says, this spot was formerly the site of a chapel, but no vestiges of it now remain. The existence of such a building, however, is not improbable, as the sea has made great encroachments on this part of the bay. A large wood, called "Crow's Wood," frequently mentioned in ancient records, has been submerged, and traces of it are still evident in the sand at low water. Vast quantities of shell-fish, but particularly oysters, are caught or dragged on the coast here: hence the origin of the term Oystermouth as the designation of the parish, which, according to the parliamentary returns of 1811, contains 200 houses and 761 inhabitants.

On a knoll or eminence east from the church stand the ruins of Oystermouth castle, supposed to have been erected by the Norman Beaumonts, who conquered Gowerland. It has suffered less from the ravages of time than any ruin in this part of the country, the principal walls being as yet in good condition, and most of the apartments entire. The general figure is polygonal, and the ramparts are conspicuously lofty, but there are no flanking towers except on each side of the entrance gateway. Here, according to tradition, the chancery court for the feignory of Gower was anciently held. This edifice is now the property of the duke of Beaufort, as lord of the feignory, and is much resorted to by parties of pleasure from Swansea and the neighbourhood. In one of the dungeons of the castle is a circular stone pillar, into which almost every visitor sticks a pin, conformably to an old custom, practised from time immemorial. The whole ruin is covered with a profusion of ivy.

Westward from Oystermouth is the parish of Pen-Arth, part of which is conjectured to have been anciently the site of a considerable town, as many foundations of houses are dug up among the sands, and there is still a village to the south of them, called "South-gate," and also a farm house to the north, called "Norton" or "North-Town." Here are also very extensive remains of a castle situated near the mouth of a small rivulet, which divides the parish of Pen-Arth from that of Pen-Maen. The gateway is almost entire, and is a very fine specimen of ancient architecture. Between this fortress and the sea, on the sands, is a rock, called "The Three Cliffs," from its resemblance to three

fugar loaves placed in a line. In the centre of this rock is a curiously formed arch, supposed to have been excavated by the sea; and not far from hence is a singular cavern in the cliff, called "Bacon's Hole." This cavern is situated nearly midway between the water and the summit of the rock, and is inaccessible from below in any state of the tide, but there is a narrow and very steep path leading down to it from above, by which, though the attempt is fraught with the utmost danger, many persons descend. Carlisle's Topographical Dictionary of Wales, 1 vol. 4to. 1811.

OZÆNA, in *Surgery*, from *ὄζω*, a fetid smell, usually signifies a fetid ulcer, when situated within the cavity of the nose, and frequently accompanied with caries.

This disease, in the early state, is sometimes attended with many of the common symptoms of a catarrh. As Mr. Pearson remarks, a trifling swelling and redness take place about the ala nasi, accompanied with a discharge of mucus. The air is transmitted through the affected nostril with difficulty, especially during sleep; and, in the morning, the orifice is often quite obstructed by mucus. As the disease advances, the discharge assumes more of a purulent appearance, and it is most abundant in the morning. Sneezing and slight hemorrhages occasionally happen. The ulceration often extends outwardly, spreading round the ala nasi over the cheek; but it hardly ever destroys the ala nasi, or spreads far from the nose.

This disease is described by Mr. Pearson as being frequently connected with scrofula and venereal complaints; and he states, that in the latter case, more frequently than in the former, carious portions of the ossa spongiosa come away. Many venereal patients, whose complaints have been properly treated, sometimes complain of a discharge of fetid matter from the nostrils, and of troublesome incrustations within the cavities, for a considerable time after the perfect cure of their original disease. According to the preceding writer, these symptoms generally indicate the presence of carious bone; and when that has exfoliated, the complaints will cease.

The ozæna frequently occurs as a symptom of cachexia syphiloidea. It will perforate the septum nasi, destroy the ossa spongiosa, and sometimes render the ossa nasi completely carious. The depression of the nose, from the loss of the ossa nasi, is, according to Mr. Pearson, more frequently the effect of the cachexia syphiloidea, at the present day, than of lues venerea.

As abscesses of the antrum are attended with some symptoms, which resemble those of the ozæna, the surgeon must be upon his guard against mistaking one disease for the other.

When the ozæna is altogether a local disease, as it must be regarded, when entirely kept up by the presence of a dead portion of bone, that has not yet exfoliated, constitutional remedies appear to be unnecessary. The dead bone will in time be cast off, and the fore spontaneously heal. But, in every instance, the utmost care must be taken to keep the part affected as clean as possible; and, with this view, alum and zinc injections are proper.

When ozæna, however, is dependent upon a scrofulous affection of the constitution, upon lues venerea, or what is termed the cachexia syphiloidea, the particular remedies for these particular states of the system must be given, ere the ulcer can be cured.

The principal internal medicines, employed for the cure of the ozæna, are,

1. Preparations of mercury, or antimony.
2. Sarsaparilla, elm-bark, Peruvian bark, muriate of barytes, muriate of lime.

3. Sea-bathing.

The best topical applications are,

Preparations of copper, zinc, arsenic, mercury, pulvis sternutatorius, mercurial fumigations, diluted sulphuric acid, &c. See Pearson's Principles of Surgery, edit. 2. p. 285, 286.

OZAMA, in *Geography*, one of the largest rivers of Hispaniola, on which St. Domingo is situated near its discharge into the sea. It is navigable nine or ten leagues from south to north. At the mouth there is a rock, which prevents the entrance of vessels that draw more than 18 or 20 feet of water. The road before the mouth is very indifferent, and lies exposed from W.S.W. to E. It is impossible to anchor in it in the time of the south winds, and the north winds drive the vessels from their moorings into the sea, which here runs very high. The mouth of the river is in N. lat. $18^{\circ} 18'$, and W. long. $72^{\circ} 38'$ from Paris.

OZANAM, JAMES, in *Biography*, an eminent French mathematician, who flourished in the 17th and 18th centuries, was descended from a family of Jewish extraction, but which had long since professed the Christian faith, and from one of the branches of it had held different offices in the parliament of Provence. He was born in the year 1740, and being intended for the church, his course of education was adapted to his future profession. He became, however, enamoured with mathematical studies, and so successful was he in this pursuit, that, at the age of fifteen, he wrote a sort of mathematical treatise, which was never printed, but contained many things which he thought proper to insert in the works that he afterwards published. On the death of his father, he devoted himself entirely to the sciences, and soon afterwards went to Lyons, where he commenced mathematical tutor for his support, obtained many pupils, and a considerable share of reputation. Here he acquired a passion for gaming, but was, upon the representation of a good friend, persuaded to go to Paris, where he extricated himself from the habit which he had formed at Lyons, and became highly respected for his manners, his various talents, and learning. For several years he derived a considerable income, from teaching the mathematics at Paris. In 1701 he had the misfortune to lose his wife, with whom he had lived most happily many years, and by whom he had twelve children. This circumstance, added to some others that were very distressing, reduced him to a state of melancholy, from which he was in a good measure recovered by the honour of being admitted, in the same year, an *élève* of the Royal Academy of Sciences. He died in 1717, at the age of 77. M. Ozanam was usually distinguished by a mild and calm disposition, a cheerful temper, which manifested itself under many heavy and very accumulated distresses. He was sincerely pious and devout, but studiously avoided all theological controversy, and was accustomed to say, when urged on that topic, "that it was the business of the Sorbonne to discuss, of the pope to decide, and of the mathematician to go to heaven in a right line." He published a great number of useful books, chiefly introductory to the sciences; among which were "A Course of Mathematics, comprehending all the most useful and necessary Branches of this Science," in 5 vols.; "A Treatise on Fortification, containing the ancient and modern Methods of the Construction and Defence of Places," 4to.; "Mathematical and Philosophical Recreations, containing numerous, useful, and pleasing Problems in Arithmetic, Geometry, Optics," in 2 vols. 8vo.

OZAR, in *Geography*, a town of Persia, in the province of Segestan; 62 leagues S.E. of Zareng.

OZAR, a town of Italy, in the principality of Piedmont; 10 miles S. of Turin.

OZE, a word used by some writers to express a factor, or ill smell of the mouth.

OZEMAN, in *Geography*, a town of Asiatic Turkey, in the province of Natolia, between Amasieh and Tocat.

OZENE, in *Ancient Geography*, a name given in the Periplus of the Ærythrean sea, as well as in Ptolemy, to the city now called *Ougein*; which see.

OZERNAIA, in *Geography*, the name of two fortresses of Russia, in the government of Upha, on the Ural; one 40 miles W. of Orenburg, and the other 64 miles E. of it.

OZERNOVSKOI, a cape of Russia, on the eastern coast of Kamshatka; 32 miles N.E. of Ukiuskoï.

OZIGINA, an ottrog of Russia, on the Indigirda; 144 miles N.N.E. of Zashniversk. N. lat. $69^{\circ} 30'$. E. long. $142^{\circ} 22'$.

OZINO, a town of Japan, in the island of Nippon; 25 miles N. of Meaco.

OZINOVSKOI, a town of Russia, in the government of Perm, on the Kama; 16 miles N.N.E. of Ofa.

OZMA, a town of Bulgaria, on a river of the same name; 21 miles S. of Nicopoli.

OZOHOWK, a town of Poland, in Volhynia; 14 miles S.S.E. of Kreminick.

OZOLAVA, one of the larger Navigator's islands, in the South Pacific ocean; the inhabitants of which greatly resemble those of Maoua. S. lat. 14° . W. long. $171^{\circ} 25'$.

OZOPHYLLUM, in *Botany*, a genus of Schreber's, the name of which is derived from *ὄζω*, to stink, and *φυλλον*, a leaf, in allusion to the unpleasant scent of its foliage when bruised. Schreb. 452. Willd. Sp. Pl. v. 3. 585. Mart. Mill. Dict. v. 3. (Ticorea; Aubl. Guian. v. 2. 689. Cavan. Diss. 6. 362. Juss. Gen. 264.)—Class and order, *Monadelphia Pentandria*. Nat. Ord. *Meliæ*, Juss.

Gen. Ch. *Cal.* Perianth inferior, of one leaf, very small, five-toothed, acute. *Cor.* Petals five, their long claws united into the form of a tube; their limbs oblong, obtuse, spreading. *Stam.* Filament cylindrical, sheathing the style, five-toothed at the apex; anthers five, oblong, erect. *Pist.* Germen superior, five-lobed, surrounded by a gland; style thread-shaped, longer than the petals; stigma capitate. *Peric.* five-celled. *Seeds* unknown.

Ess. Ch. Calyx five-toothed. Corolla funnel-shaped, of five petals. Style one. Capsule? five-celled.

1. *O. fetidum*. Mart. Mill. Dict. (O. trifoliatum; Willd. Ticorea foetida; Aubl. Guian. t. 277. Cavan. Diss. t. 206.)—This solitary species of *Ozophyllum* is a native of the forests of Guiana, where it flowers in February. *Stem* shrubby, about ten or twelve feet in height, much branched, covered with a smooth, green bark. *Leaves* alternate, digitate, on long stalks; leaflets three, the central one larger, all smooth, soft, oval, sharp-pointed. *Flowers* terminal, corymbose, white.

Willdenow has changed the specific name to *trifoliatum*, but since the whole plant, when bruised, emits a strong disagreeable smell, like that of *Stramonium*, we are induced to retain the original one of Aublet, notwithstanding Schreber's generic name is expressive of its foetid qualities. The wood of this shrub is described as white, tender, and fragile.

OZUNICZE, in *Geography*, a town of Lithuania, in the palatinate of Wilna; 30 miles E.S.E. of Breslaw.







